AN URBAN ENVIRONMENTAL PERCEPTION STUDY:
THE NOTATION OF A SENSORY EXPERIENCE

by

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CHAPTER ONE

INTRODUCTION

The introduction describes the causes and effects of perceptual activity in the urban landscape. Part two covers the research scope and design and discusses revelance to the landscape architecture profession. The last section contains operational definitions and thesis chapter outline.

RESEARCH CONTEXT

Perceptual activity plays a vital role in our lives. First it is a primary source of contact with the world - all its sights, sounds and smells, simple and subtle meanings, preferences and values. Second, it orients us in our surroundings, provides us with information and is the basis for structuring our image of the environment (Ittelson 1974).

"Image" is a broad term and can be vague in its interpretation. For clarification and general use in this study, image and the image-building process refers not only to a mental picture of objects or elements but also includes values and symbolic and personal associations each person places on that element. Thus, the image is the sum of direct sensory interaction as interpreted through an individual's value system.

In current research, the image-building process is examined in a wide range of fields, including the perceptual, sociological and behavioral sciences. This study will be conducted from an environmental perception perspective, meaning the study will focus on the intensity or degree of use and quality of multisensory experiences that occur in outdoor urban landscapes.

Like image, the term "perception" has a multitude of meanings. Environmental perception generally refers to the relationship between **sensations**, which is a response to stimuli; **cognition**, a process of understanding and learning; and **evaluation**, a qualitative assessment of the percieved experience (Rapoport 1977, Pocock & Hudson 1978). The schematic diagram below illustrates these interlocking perceptual processes (Fig. 1.1).

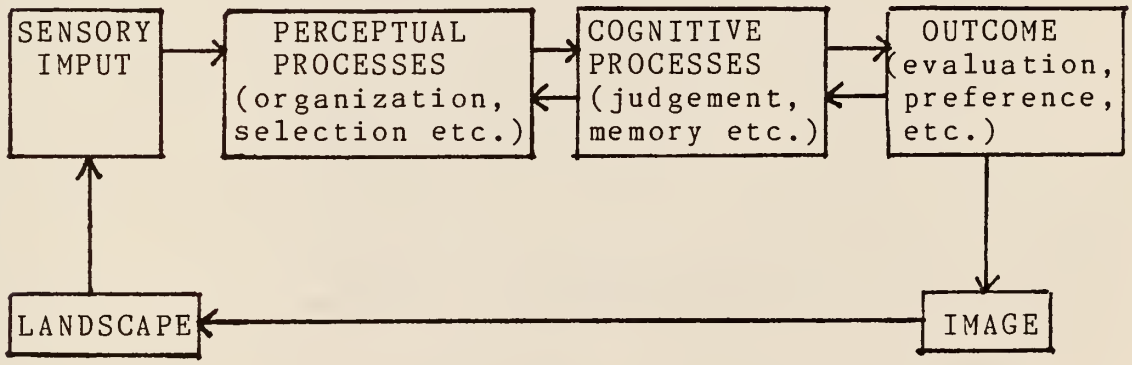


Fig.1.1 Environmental Perception Model
(Adapted from Palmer 1986)

Usually our initial perceptual contact with the environment is visual. Vision is the dominant sensory mode and contributor to the image. Designers have been particularly prone to stress visual attributes to the exclusion of the other senses - partly because visual criteria is more easily controlled and easier to deal with in drawings and models (Rapoport 1977). The problem with this one-sided outlook is that it engages the individual in a less dynamic perceptual environment. Perceptual dullness results from an absence of multisensory stimulus, especially when lived in a homogeneous environment designed for uniformity and predictability.

Therefore the roles of sound, smell and touch are supportive and vital. They add contrast, continuity and meaning to the visual scene and encourage a metamorphosis from "space" to "place". (Pocock & Hudson 1978). The manner in which we have contact with the environment is no less important than the nature or level of contact. Today, more and more the boundries of city development reach outward. Getting from here to there is more crucial than ever, and so is the experience of it. This is aptly expressed by Kepes in his Notes on the Expression and Communication in the Cityscape (1961), where "the basic unit of our urban vision...is not the fixed spatial location but the transportation defined pattern of a sequences of vistas...".

This highlights one more aspect in the field of urban environmental perception studies, which is - movement forms the context of our spatial and sensoral experiences. In practice designers and planners need to know how environmental patterns are formed and how to structure these experiences so that it will be of value and significance to all those who percieve it.

RESEARCH SCOPE

The intention of this study is to examine the environmental perception relationships between observers and the landscape. Specifically the scope of this research is two-fold: one, to define the sensory factors (sight, sound, smell, and physical response) used in experiencing the outdoor environment, with consideration to how they formulate basic mental imagery of an experience. Two, this study will attempt to design a format for recording and illustrating the percieved patterns and quality of sensory contact. Fig 1.2 (p.5) provides a diagram of the research model.

RESEARCH DESIGN

Two analytical approaches have been combined for purposes of this research. The combination accomplishes documentation and evaluation of observational activities that aid in the imagery process, while employing a graphic

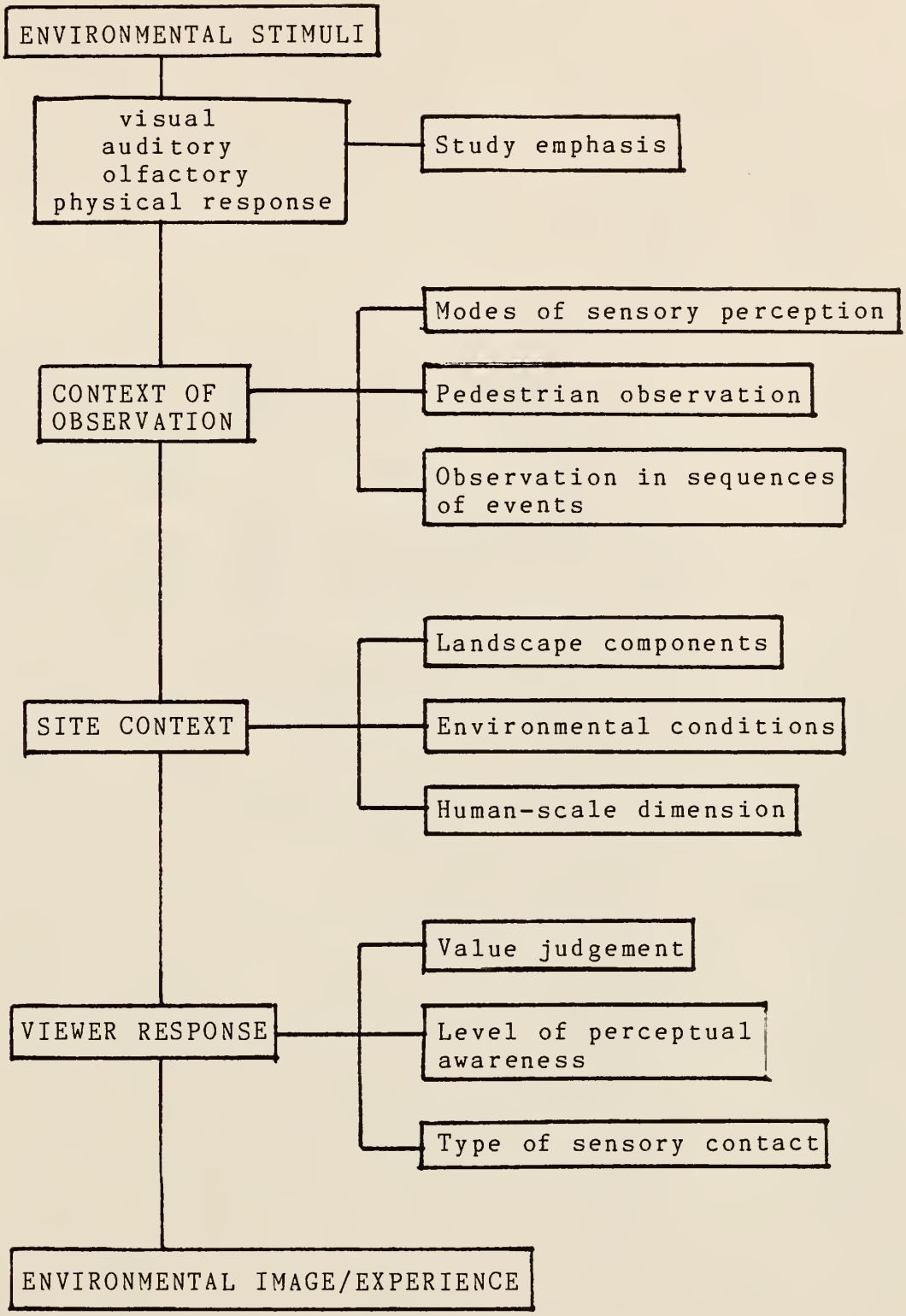


Fig.1.2 Research Model

model for illustrating environmental elements and attributes in a clear, easy-to-read format.

An environmental assessment method is used for the data collection and evaluation phase. With this method, participants obtain systematic descriptions of a specified small-scale urban setting. The data will be transcribed graphically onto a special format called a sequence-notation system. This form presents information in an organized manner for the analysis of physical and sensory components. An example of the form is provided in Appendix B, p.103.

RESEARCH RELEVANCE AND GOALS

The research reported here will augment research studies which have previously been conducted in the field of environmental perception, specifically in the area of environmental quality assessment. Landscape attributes and values are some of the current topics among researchers and environmentalists who are interested in improving the quality of life. It is a source of evidence to the complexity and richness in environmental perception theory and has potential as applied indices for monitoring environments, guiding public policies and providing valuable input in the design process (Ittelson 1978).

This paper also adds to the body of studies conducted by Halprin (1965), Thiel (1961), Lynch (1960)

and Appleyard et al. (1964) who have all recognized that movement and the complex interelationships it generates as an important perceptual activity in urban environmental experiences. These studies have shown that urban designers should consider the sense of motion as an essential design element. Also a design tool combined from a descriptive assessment and notation system would allow designers to program and analyze, quantitalively and qualitatively, environmental sensory elements and forces in an organized, sequential manner - much in the same way as they are experienced in reality.

Finally, a common goal of this research and those it has built on, is to understand the relationships between landscape components and the variety of perceptions that serve to form the image of our environment. The imageability factor is important for it is a source of awareness to the phenomena and conditions of the landscape and in a social/cultural sense, it defines the character and content of our personal and public surroundings.

OPERATIONAL DEFINITIONS

For the purpose of this study, certain meanings have been associated with the following terms and concepts. Terminology not already explained in the body of

the text are defined below. Definitions not credited are those of the researcher.

Control Viewpoint

A designated observation station point which provides the means for studing landscape component, characteristics and qualities (Smarden et al. 1986).

Environment

The aggregate surroundings of biological functions, social and cultural conditions that influence the lif of an individual or community (Schrader 1987).

Environmental Attributes

The qualities, characteristics or properties pertaining to the landscape (Smarden et al. 1986).

Environmental Components/Elements

Features which compose the characteristic landscape, ie. land and water forms, vegetation and structures.

Environmental Quality

The sum total of the forces and factors which influence people's value judgements of the landscape and the experiences therein.

Experiential Approach

A means of studing the landscape by direct,physical contact with environmental elements and events.

Graphic Notation System

An illustrative method for collecting, ordering and presenting information pertaining to human responses and physical data (Buchanan et al. 1974).

Sensory Environment

A composite experience in which all sensory modalities, ie. sight, smell, touch, hearing and movement are used to comprehend landscape function and meaning.

Sequence Notation System

Same as graphic notation system, except data is presented as a continuous or connected, linear series of elements and/or events.

THESIS CHAPTER OUTLINE

Chapter Two presents the contextual issues which provide the information necessary for the foundation of the study. Included are a brief synopsis of landscape perception concepts, a review of sensory/movement studies and a discussion of environmental analysis procedures. Chapter Three covers the research methodology and criteria involved in defining, analyzing and illustrating environmental information. Chapter Four contains data results and relationships to the research hypothesis. Chapter Five evaluates the study procedures and presents conclusions and recommendations.

CHAPTER TWO

BACKGROUND

This chapter reviews environmental perception theories, concepts and analysis methods revelent to sensory stumulus and urban imagery.

THE NATURE OF LANDSCAPE PERCEPTION

Before elements can be organized and evaluated, they must be perceived. Environmental perception is the most fundamental activity linking people and environments, and is the most direct form of sensory experience. Perceptual activity involves all aspects of the landscape, not just small parts of it.

Environmental perception is a product of the greater effects of motion and awareness from changes in views, spaces and features; there is an ambience or atmosphere which is difficult to define but very important and consists of social as well as physical elements, people as well as things (Rapoport 1977). Ittelson (1973) developed and summarzied this process as part of his research on an individual's landscape perceptions. Note that in Zube, Sell and Taylor's (1982) review of his process, they considered the environment as broad categories of informational content rather than as specific physical features (Fig. 2.1, p.11).

1. **Landscapes surround.** They permit movement and exploration of the situation and force the observer to become a participant.

2. **Landscapes are multimodal.** They provide information that is received through multiple senses and that is processed simultaneously.

3. **Landscapes provide peripheral as well as central information.** Information is received from behind the participant as well as from in front, from outside the focus of attention as well as within.

4. **Landscapes provide more information than can be used.** They can simultaneously provide redundant, inadequate, ambiguous, conflicting and contradictory information.

5. **Landscape perception always involves action.** Landscapes cannot be passively observed; they provide opportunities for action, control and manipulation.

6. **Landscapes call forth actions.** They provide symbolic meanings and motivational messages that can call forth purposeful actions.

7. **Landscapes always have an ambience.** They are almost always encountered as part of a social activity, they have a definite aesthetic quality and they have a systemic quality (various components and events are related).

Fig. 2.1 Landscape Information Modes

The first four aspects describe the actual stimulus provided by the environment to the observer. The last three address the actions or outcomes from that contact.

All of the above models have been the basis for various research studies. Three of these models relate to the intent of this study:

1. Movement provides the means to explore the environment in a systematic way, thereby facilitating a mental mapping process (Item 1).

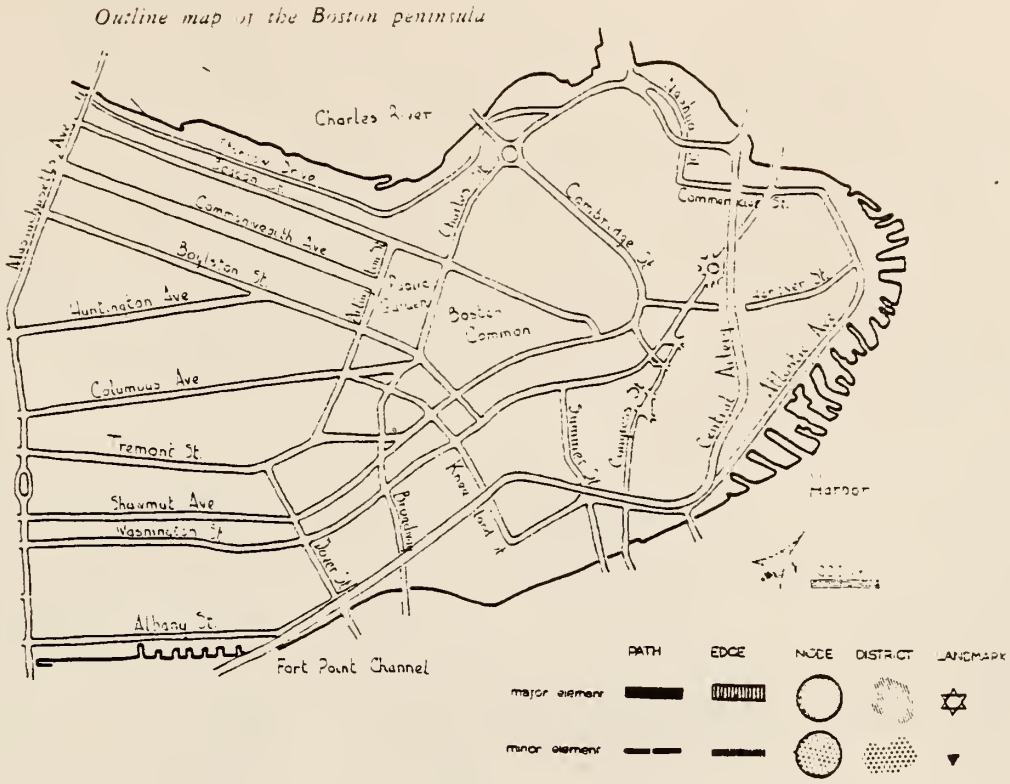
2. All the senses are used when experiencing an environment (Item 2).

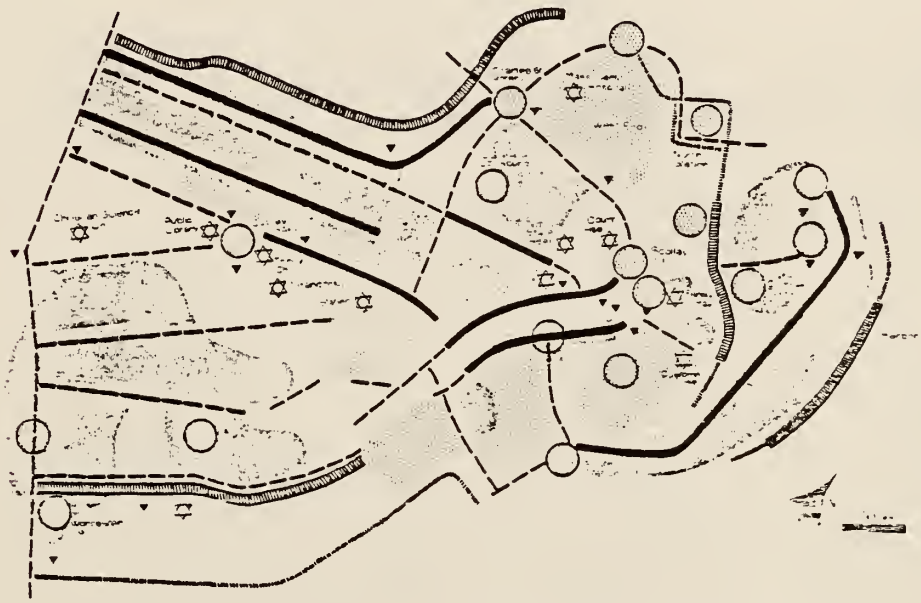
3. The aesthetic quality of an experience results from a positive or successful relationship between the person and the landscape and between the landscape elements themselves (Item 7).

URBAN IMAGERY STUDIES

The perceptual process is a link between people and the environment, the product of that activity is an image - which is related to, although not a copy of the objective environment (Pocock et. al. 1978). When attention is turned to the content of the mental model or image, the most obvious component is its physical structure. In his work on the Image of the City (1960), Lynch hypothesised that people simplified the city's form by organizing it in terms of five elements - paths, edges, districts, nodes and landmarks (fig.2.2, p.13).

Allthough he recognized an image was a combination of physical attributes, identity and meaning, he focused on the role of form and the concept of "imageability". In short he defined it as "that quality in a physical object





The visual form of Boston as seen in the field

Fig. 2.2 Visual city elements Source: Kevin Lynch, 1960, The Image of the City

which gives it a high probability of evoking a strong image in any given observer" (Lynch 1960, p.9).

Subsequent studies have elaborated on the Lynch theme. For example, the study by Harrison et. al. (1972) was built upon the premise that the image component Lynch termed as "meaning" played a much stronger role in the mental mapping activity than he may or may not intentionally implied. Others have attempted to determine design factors which contribute to the automobile passenger's imagery of freeways (Appleyard et.al. 1964 and Carr et.al. 1969) and since Lynch mainly approached the image building process from a visual standpoint, Southworth (1969) expanded the sensory context by evaluating the influences of sound and smell as well.

This study borrows on Lynch's "imageability" concept by attempting to design a research model built on the expanding field of urban imagery studies. This takes form in a study of relationships - an analysis of sensory elements, conditions and observer contact and a study of the patterns resulting from that contact.

SENSORY STUDIES

People perceive the urban environment through visual and non-visual clues. These signs are a combination of stimulus such as the visual sensations of color, shape

and light, along with non-visual properties such as smell, physical contact and sound. The majority of perceptual and environmental assessments have placed their emphasis on visual attributes (Ittelson 1973, Rapoport 1977). More frequently than not, urban-based design theories, concepts and site plans are heavily influenced by those studies. A small porportional amount of research has explored how the perceptual senses work together, what kind of images they produce and how those images relate to the surroundings.

Two studies, Anderson et.al. (1983) and Southworth (1969) have considered and examined the attributes and qualities of sound in urban spaces. Both explored, in different ways, acoustical and visual image relationships in the outdoor context. Southworth examined the role of visual and auditory clues in urban settings. He explored two aspects - the percieved variety and character of city sounds and the influence sounds have on perception of the visible city. Differing from Southworth, Anderson assessed auditory responses in a diverse range of situations - from wooded to built environments. He attempted to evauate a site's environmental quality by the appropriateness of certain sounds to that setting. Sounds effects were recorded and replayed back in different settings,included were vehicles, aircraft, construction equipment and human and natural sounds, such as wind, birds and crickets.

The results of Southworth's study showed auditory quality depend on more than the physical aspects of that sound. Low to middle frequencies were preferred but sounds which were distinctive, unusual and informative were given the most favorable responses. Also it appeared that memorable environments contained sounds which communicated more about the spatial structure and general character of that area.

Anderson's conclusions revealed three things - one, a setting may induce expectations about what sounds will be heard in it; two, those expectation may affect the tolerance of noise and/or appreciation of those sounds; and three, the particular qualities of the sounds-expected or not- influenced overall evaluations of a setting.

Common findings in both studies were the effects of traffic noise in the city. Anderson's participants considered traffic an enhancing sound. He concluded that the appropriateness of traffic to a downtown area made it somewhat more acceptable. Southworth's participants appreciated somewhat different aspects of vehicular noise. On one end of the scale, car sounds were attention demanding and alerted people to the dangers of busy streets and intersections; otherwise if traffic sounds were far away, they seemed to produce a wave-like sonic quality and had a pleasing effect. This research will

explore, as in these studies, correlationships between sound and setting. For example, what combinations of sound attributes - intensity, duration, quality etc., produce pleasing or unpleasant responses about a space; also what influence or role do auditory factors have in the image process when compared to other sensory stimulus.

MOVEMENT STUDIES

The sense of motion is an important activity in perception of urban environments. Understanding the complexity of changes in orientation, sequences of views and everchanging experieces have been, and are the topic of concern in many perception studies.

One of the forerunners in the movement-oriented method of urban analysis was Gorden Cullen. In his books, Townscape (1961) and Concise Townscape (1971), Cullen addressed issues pertaining to the perceptions of traffic, visual features and the landscape. His work pioneered the concept that visual perception and appreciation of urban spaces could be based on aesthetic principles. A major advancement of his was refining the quality of graphic analysis. He illustrated urban spaces as spatial sequences - a combination of existing and emerging views (Fig.2.3,p. 18). He promoted the experiential aspects of looking and moving through spaces and thought it should be used as a

Fig. 2.3 Spatial sequences Source: Gorden Cullen, 1961, Townscape

creative analysis model by suggesting "we design our towns from the point of view of the moving person" (Cullen 1961,p.12). This way the whole city could be designed as a sequence of experiences, containing a variety of emotional responses and images composed of views, places and content.

THE HIGHWAY AESTHETIC

Research using the kinesthetic concept has developed along two forms of movement, either as a motorist or pedestrian. Both Appleyard et al.(964) and Carr and Schissler (1969) examined the city seen and experienced from the highway. Appleyard's book, The View From The Road (with Lynch and Meyer 1964), established the conceptual foundation for dynamic perception - a perception which constantly changes, where noticeble differences are seen, mentally recorded and formed into images. Their studies have explored how and what images are formed by freeway travel. Since movement functioned as the means of analysis, this highlighted the need for the use of a methological technique that could, in Appleyard's estimation "record visual sequences using easily understood, reproducible drawings which could compress the essence of the experience into a small space" (Appleyard et.al. 1964, p.21). Subsequently a sequence-notation system was determined as the best method for recording

existing situations and environmental contexts (Fig.2.4, 5, 6, pp.21,22,23). Thiel's (1961 and 1971) notation system was adapted by Appleyard for this purpose.

PEDESTRIAN AESTHETIC

The highway experience is one of speed and a blur of roadside features. Compared to this, pedestrian movement involves a very different set of perceptions and activity. Contact with the landscape is more leisurely. The observer is free to explore the environment in many ways, such as strolling, walking, running or climbing. From this perspective, subtle differences are more apparent and suggest a close-up, micro-scale type of analysis.

The pedestrian viewpoint has been the focus of researchers Thiel (1961,1970,1971), Cullen (1967) and Halprin (1965). Thiel concentrated on developing a sequence-notation system to graphically illustrate the physical dimensions of space, human activity and temporal variations (Fig.2.7, 8, pp.24,25). Halprin considered the visual and physical patterns of movement by notating prominent elements and events sensed by people as they moved through different spaces (Fig.2.9, p.26).

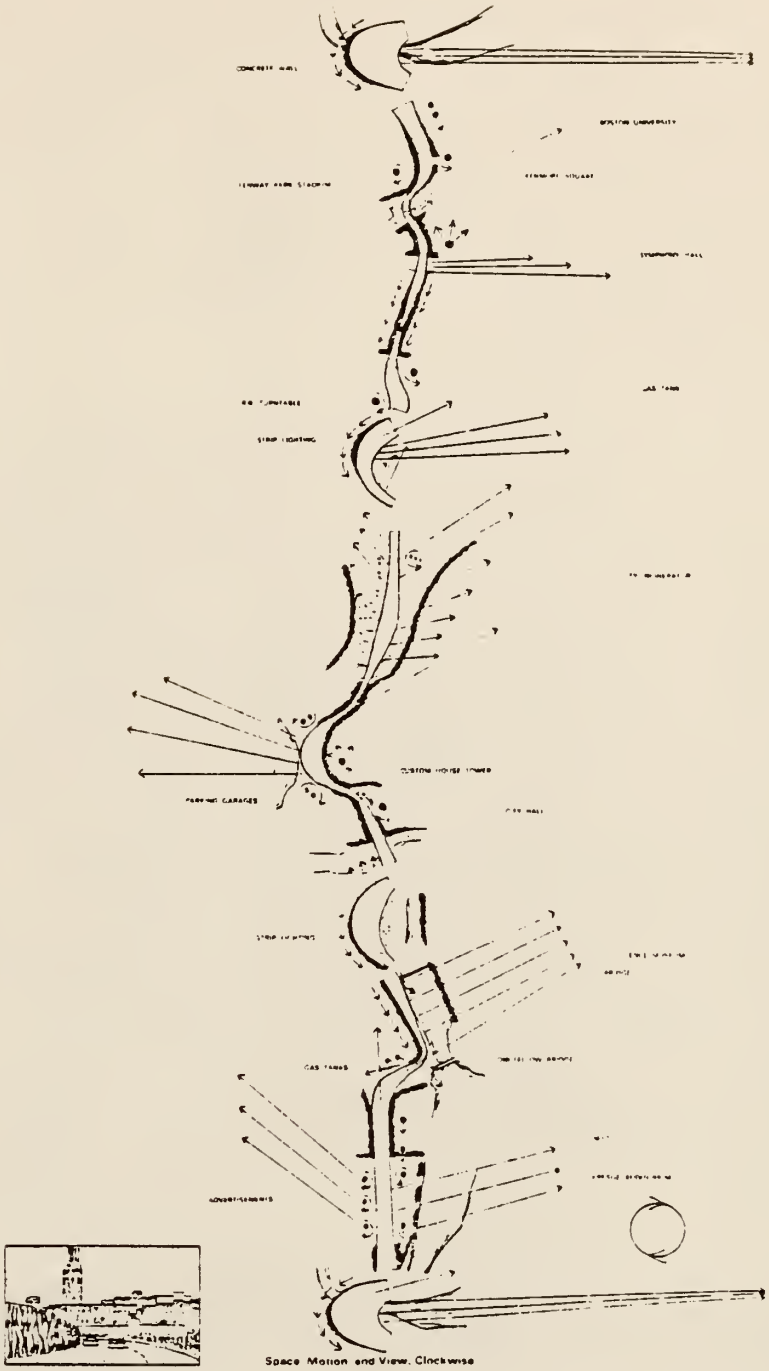


Fig.2.4 Orientation Source: Donald Appleyard et.al.,1964, The View From The Road

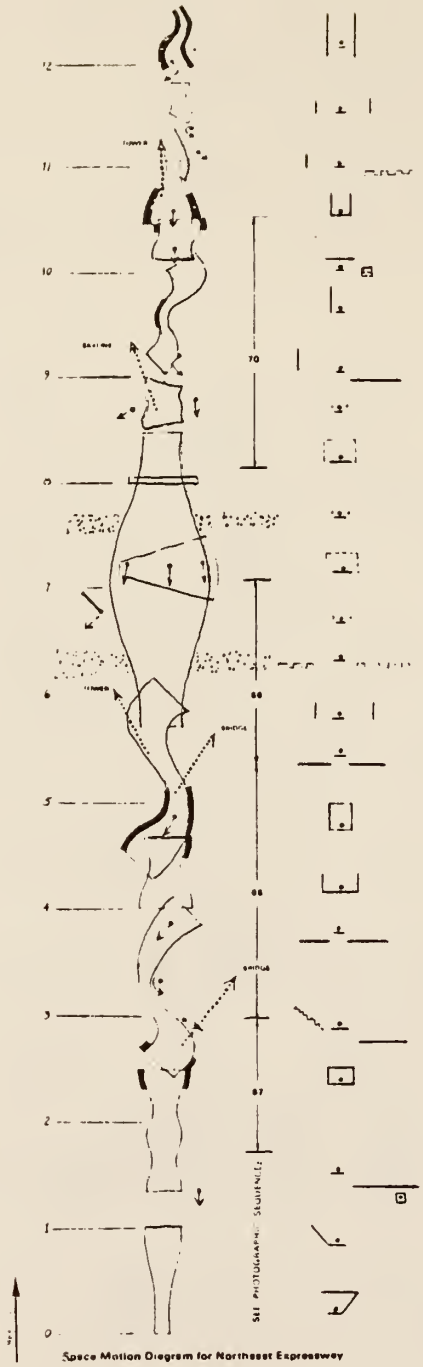


Fig. 2.5 Space motion diagram Source: Donald Appleyard et.al., 1964, <u>The View From The Road</u>

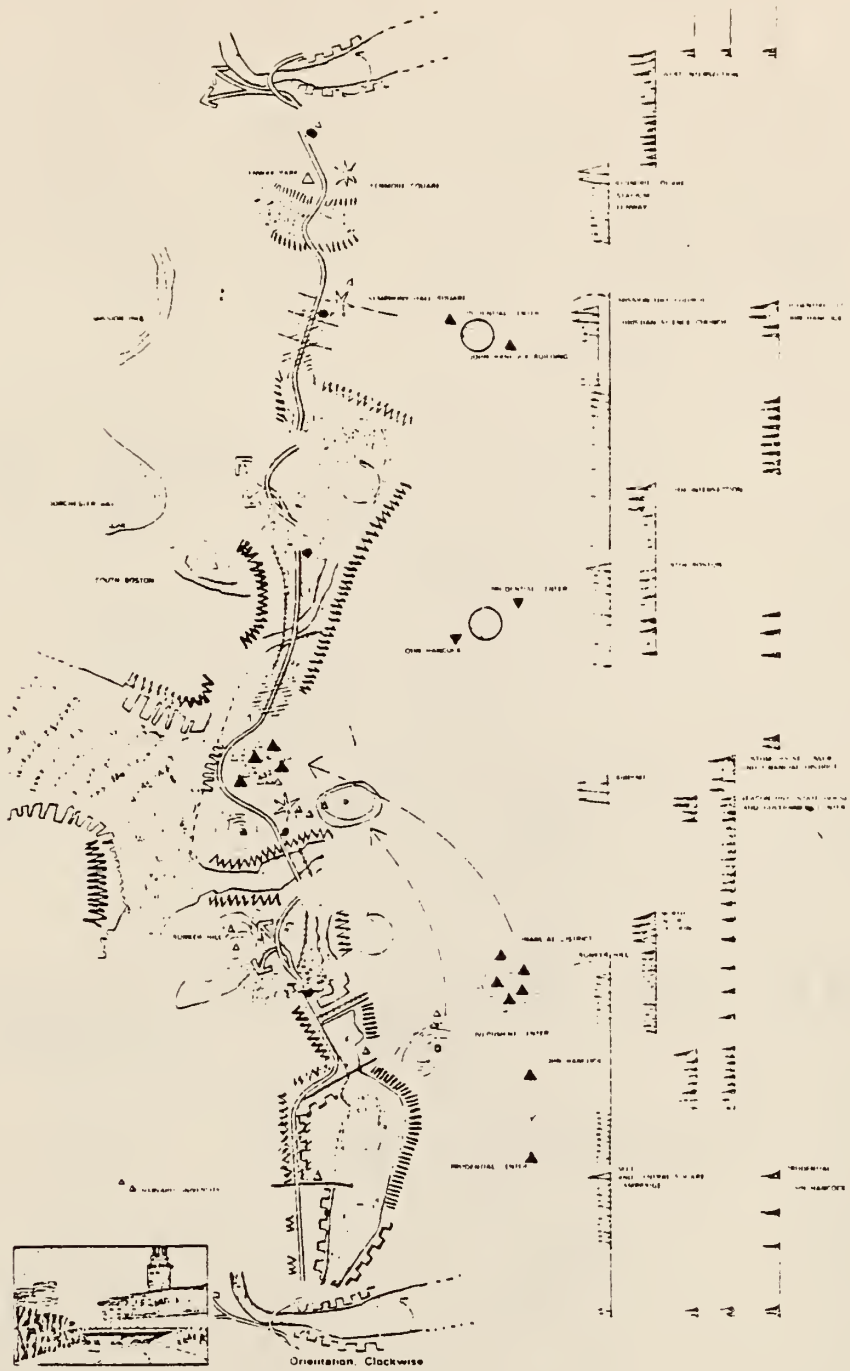


Fig. 2.6 Sense of motion Source: Donald Appleyard et.al., 1964, The View From The Road

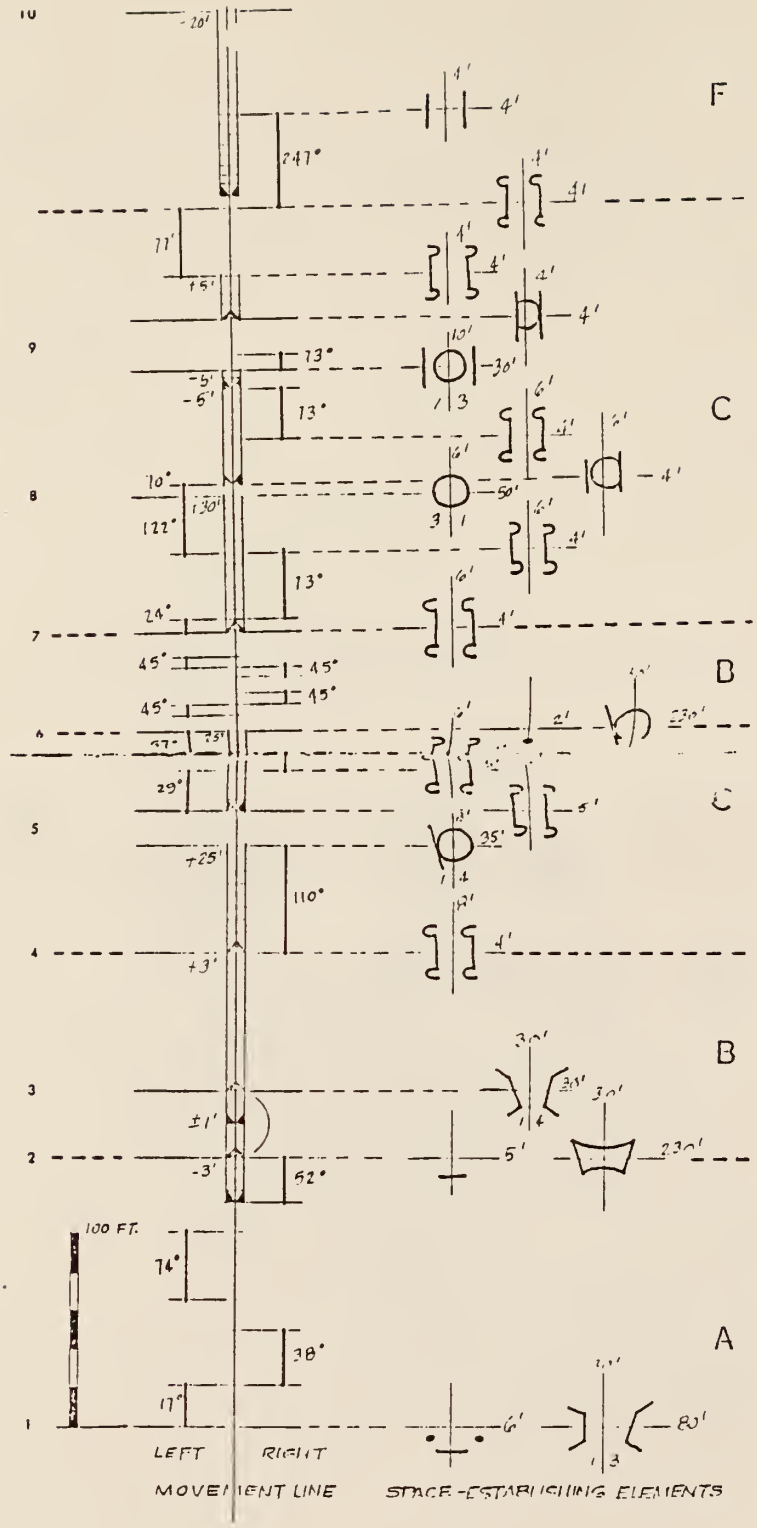


Fig. 2.7 Spatial sequence notation Source: Philip Thiel, July 1962, Landscape Architecture Magazine

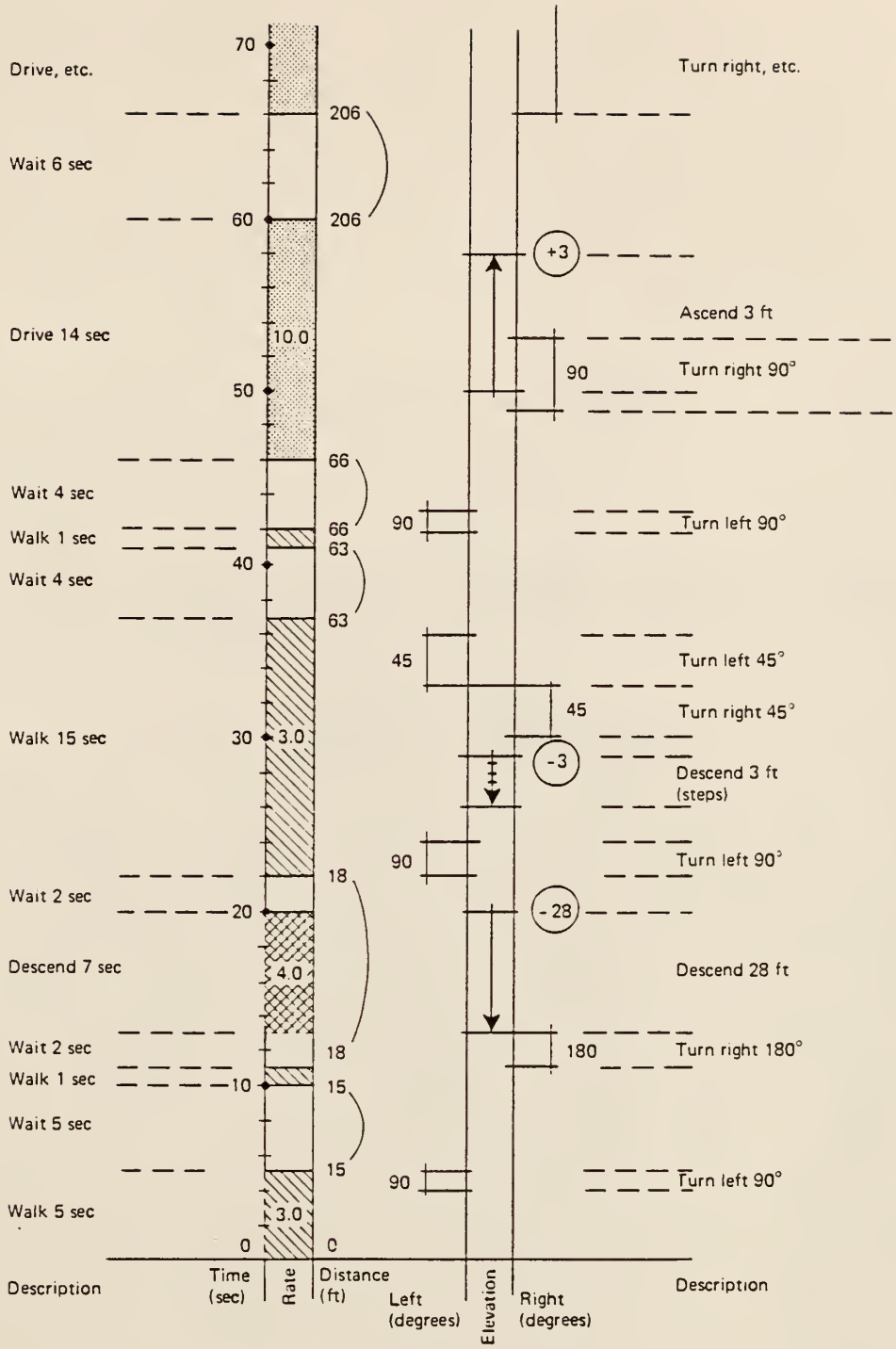


Fig. 2.8 Movement time line Source: Philip Thiel, 1970, Environmental Psychology

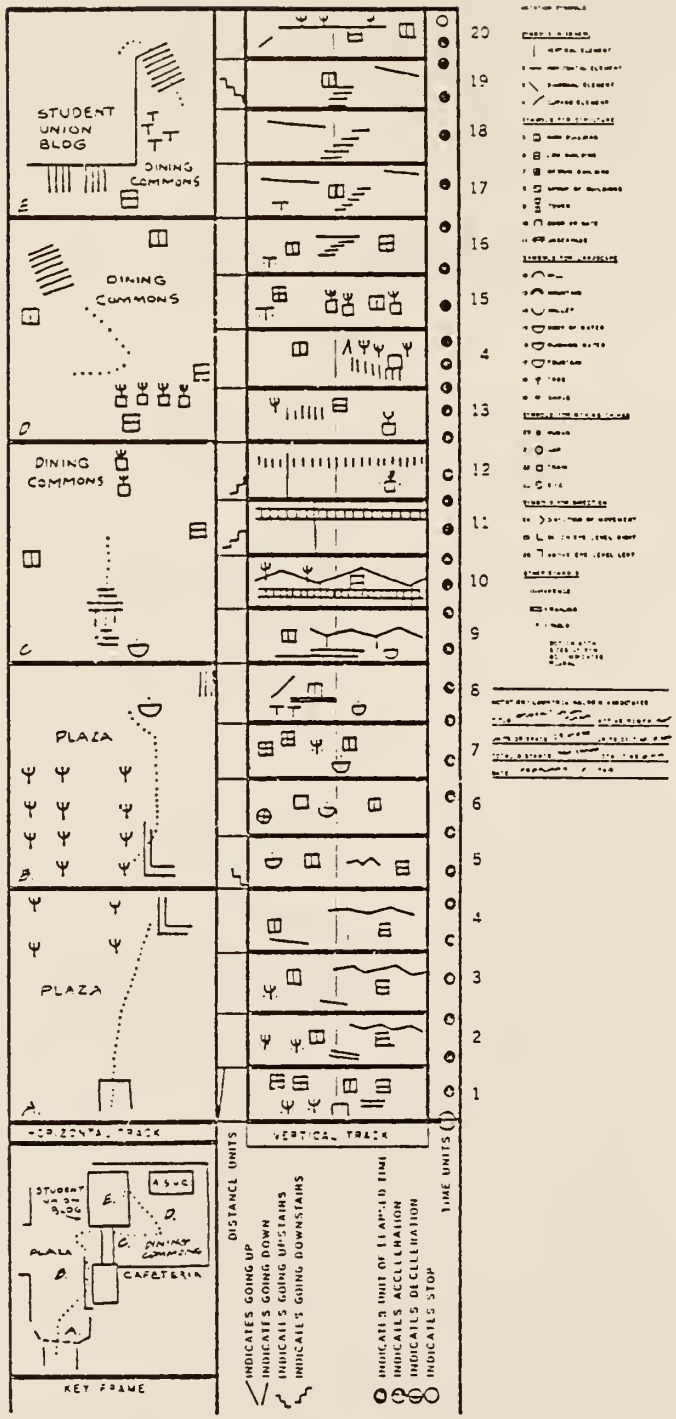


Fig. 2.9 Motation form Source: Lawrence Halprin, July 1965, Progressive Architecture

In this research, the importance of these systems is two-fold: they outline an adaptable conceptual framework - studying environments as they are really experienced in a sequential context; and they provide a methodological framework - one in which human responses and physical data may be defined and recorded in a simplified manner so that we may understand and evaluate them better.

THE NATURE OF ENVIRONMENTAL ANALYSIS

The intent of many urban imagery studies is to determine how components form the environmental image. There are two ways of studing this: one is a physical analysis of objects, spaces and site conditions, the other is a psychological assessement of the characteristics or quality of those elements within that context. Landscape elements and conditions are usually measured objectively, meaning the evaluation focuses more on °what' is there, rather than on °how' or °why' (Zube et al.1982). The procedure is usually conducted by skilled and trained observers who obtain systematic descriptions of places. The scope of research is expanded when perceptual activity is included by examining the environmental factors which influence observer's impressions, preferences and/or behavior within the setting (Craik 1971).

These two analysis modes have been combined for the purposes of this research. The combination facilitates the analysis of human observation activities while employing a model for establishing and illustrating the environmental elements and attributes which aid the imagery process. This dual approach becomes the basis for a dynamic rather than static model of environmental assessment.

The methods for collecting research data come in many forms and of varying sophistication. For example, data can be acquired by free descriptions, such as character sketchs of places. This allows the participant to use concepts and terms they feel comfortable with. However this is seldom used alone because of certain restrictions, such as the limits it places on the use of systematic and comparable descriptions.

A variety of supplementary techniques have been developed to correct this shortcoming, ranging from adjective checklists to rating scales. Some are designed to assess the natural landscape (Craik 1975, Lowenthal et.al. 1967, Calvin et.al. 1972, so on) while others evaluate the built environment (Kasmar 1970). As with free descriptions, some problems are associated with these methods. The format does not allow for additional imput or elaborated comments, and in many cases the procedure is conducted in a controlled environment; thereby distancing the respondent physically and psychologically from the

very subject they are assessing.

There are other means where observers have a more active role in the analysis process, such as open-ended questionaires, defined descriptive/evaluative responses and cognitive mapping techniques. Regardless of what procedure is used, it is important to realize the multi-dimensional nature of the environment is unlikely to be revealed by one simple method (Pocock et.al. 1978).

In many instances when the number of research variables or depth of scope is complex, several analysis forms are required. Lynch's Image of the City (1960) stands as an urban analysis prototype in the use of multi-combined techniques. Interviews, questionaires, trained observer assessments and mental mapping activities were all implemented in his group level study of "collective imagery". Many subsequent works (Harrison 1972, Appleyard 1964 & 1969, Southworth 1969) have been modeled in some way or another from this.

DISCUSSION

Upon the review of the reports and research cited in this paper, it appears that perception of the environment is a complex phenomena and involves much more than the visual comprehension of physical features alone. The increasing number of environmental perception studies may be and indication of a change in the trend from

°sanitized' urban designs - ones with reduced variety, contrasts or multisensory experiences, to designs which contribute as a whole to the greater richness of the experienced landscape. Specifically, an increased understanding of the roles each sense plays may allow designers to create sensory environments, ie. the sonic city, as suggested by Southworth (1969). Therefore, increased usage of sensory criteria in the design process can accomplish two objectives: it can create a strong identity for neighborhoods, communities or cities and it can "make the city more attractive and visually stimulating, more sensuous and interesting" for those who live in it (Ittelson 1974 p.293).

CHAPTER THREE

METHODOLOGY

This chapter discusses in the following three sections methodology issues, design criteria and research formats developed to study the physical and non-physical sensory aspects of the environment. Section one contains research intent, hypothesis, design and study context. Section two describes the overall research techniques and criteria. The last section covers the procedure for using the analysis format.

SECTION ONE

RESEARCH INTENT

Ittelson described one aspect of the landscape as having a systematic quality.

> "The various components and events relate to each other in particular ways which, perhaps more than anything else, serve to characterize and define the particular environment. The identification of these systemic relationships is one of the major features of the process of environmental perception" (Ittelson 1973, p.15).

Taking a lead from this commentary, the intent of this research is to identify and define these environmental relationships, specifically the qualitative attributes of visual, auditory and olfactory senses and develop an

analysis method to evaluate the manner in which they are used to shape the image of the urban experience.

HYPOTHESIS

The outdoor environment is never seen or responded to as simply undifferented phenomena. An individual's image or picture of a place is a product of recall - a collection of sensory perceptions, physical contact and meaningful associations. It is hypothesized that:

> Similar responses from a variety of sensory contact - sight, sound, auditory and physical activity will produce strong positive or negative feelings and result in vivid mental images of that space.

A descriptive assessment procedure will be developed to collect and display the data needed to test the validity of this hypothesis. This procedure will also be tested for it's conciseness, clarity and capability for use as a site design analysis tool.

RESEARCH DESIGN

The design used in this study is composed of two environmental perception activities. The first involves the physical measurement of objects in the actual setting, and the other involves the psychological measures - the

observer's assessment about the character and quality of the physical environment (Calvin et al. 1972).

The physical measurements of the environment include variables such as the position of site features and viewer movement. Psychological measurements include variables such as: **qualitative evaluation** of environmemtal components; the **type** of **interaction** between individuals and the landscape; and the **potency** level of sensory contact (Osgood et. al. 1957).

This research has two analysis phases, the first is a gathering of the information using what is called a descriptive checklist. The checklist outlines the specific components to be evaluated and provides the format for recording responses at the site. The second phase illustrates the data in a graphic manner for analysis purposes. It is called the notation system and is to be completed at a convienent location after the site visits.

The main analysis components are called analysis dimensions. They are: the context of observation; condition and character of sensory modes; and image awareness and assessment (Fig.3.1, p.34). Each dimension contains several sub-components deemed necessary to cover the intent of the study. Two open-ended questions are included to provide space for additional in-depth commentary.

Fig.3.1 Analysis format and questions

(List adapted from Halprin 1965, Southworth 1969, Appleyard et al. 1964, Lynch 1960, Thiel 1961,Smarden 1986)

ANALYSIS DIMENSION

*Context of observation
*Condition and character of sensory modes
*Image awareness & assessment

ANALYSIS COMPONENTS

1. CONTEXT OF OBSERVATION

*spatial composition
*viewer movement
*viewer activity attitude
*image location & function

11. CONDITION AND CHARACTER OF SENSORY MODES

*visibility model
viewshed type
image viewing sequence pattern
visual focus
scenic distinction

*auditory factors
identity
distance
intensity
quality
duration
landscape sonic responsiveness

*olfactory factors
identity
quality

111. IMAGE AWARENESS & ASSESSMENT

*image structure & strength
*composite image quality

QUESTIONS

1. In the area(s) you considered most memorable or having positive imagery, what factor(s) contribute to that choice?

2. In the area(s) you considered unremarkable or having negative imagery, what factor(s) contribute to that choice?

For the most part, their research accounts for two of the study's dimensions - the context of observation and image awareness and assessment. The condition and character of sensory modes was developed to assess environmental factors which were not specifically addressed in these other studies. These factors are adapted from urban analysis studies conducted by Smarden (1986) and Southworth (1969).

The sensory mode dimension and the image assessment category are especially important to the intent of this research. Most environmental perception components relate to the visual aspects of the environment. Lynch (1960) had suggested some directions for futher research; one of which is the addition of other sensory attributes such as sound and smell, because they would expand research topics into more of a three-dimensional, realistic context. A synopsis of all viewer evaluations is contained in the image awareness and assessment section. It compiles all the analysis imput gathered by the body of the descriptive checklist and provides the core information needed to test the hypothesis.

RESEARCH CONTEXT

As defined by Craik (1968), an environmental perception assessment has four basic components: the environment to be studied; the mode and method of contact with landscape elements; the selection of observers; and the nature of the response format (Craik 1968 & Lowenthal 1967). The first three are discussed here, the response format is described in greater detail, in section two of this chapter.

THE ENVIRONMENT - Site selection will be based on the following criteria:

1. The site will be an example of a well known urban landmark, meaning it is located in a densly populated area of the city and is heavily used by the general populus for social and recreational activities.
2. The site will have constructed pathways as a basic design feature, opposed to open or free-form spaces.
3. The site will be of moderate size to insure coverage and documentation of the various experiential possibilities.
4. The site shall be within a reasonable distance of Manhattan so numerous site visits will be feasible, if needed.

Price Woodard Park in Wichita, Kansas was chosen as the test site because it best fulfilled the require-

ments of the above criteria. Specifically the reasons for this choice are: The park, is in the heart of downtown, is a popular spot during the week for the "lunch bunch". Its' juxaposition to Century 11 insures use when exhibitions, conventions and likewise activities occur and it is considered prime seating space during the annual River Festival (Fig.3.2, p.38). Figure 3.3 (p.39) shows the park's system of connecting walkways which allow full exploration of the site. The park is approximately 4 1/2 acres - an appropriate size for walking through in one day at a comfortable pace.

Fig. 3.4, (p.40) show the particular path selected for the experiment. This path was chosen because it crossed, more or less, through the center of the park. This enabled viewers to experience the aspects of both the upper and lower elevations of the site. Also this path, at one point or another, comes in close proximity to the various amenities, features and elements common to the park. The site is located 150 miles from Manhattan, making it about a 2 1/2 hour drive and practical for frequent trips.

MODE OF OBSERVATION - Ideally, environmental perception activity is studied in the actual context. This facilitates a more accurate and true analysis of the experience in the manner of occurrence. Therefore, an

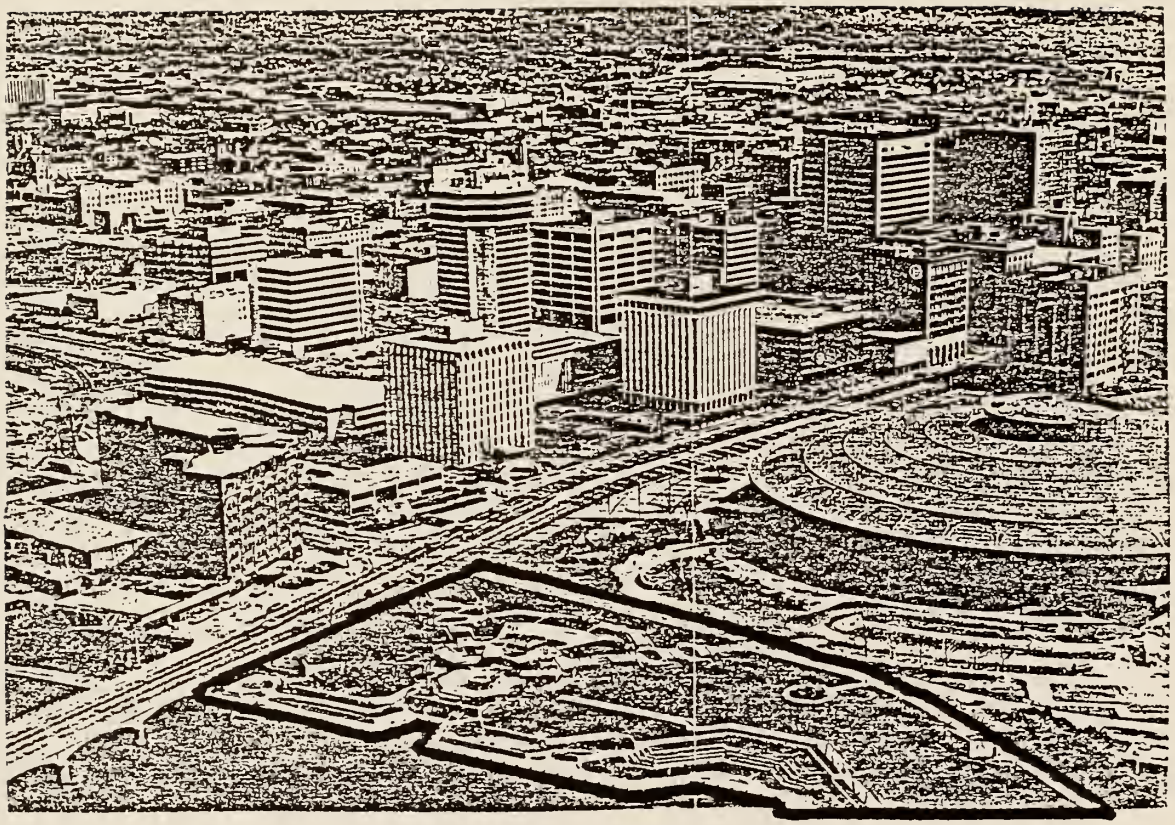


Fig. 3.2 Aerial view of downtown Wichita Source: Chamber of Commerce, Wichita, Kansas

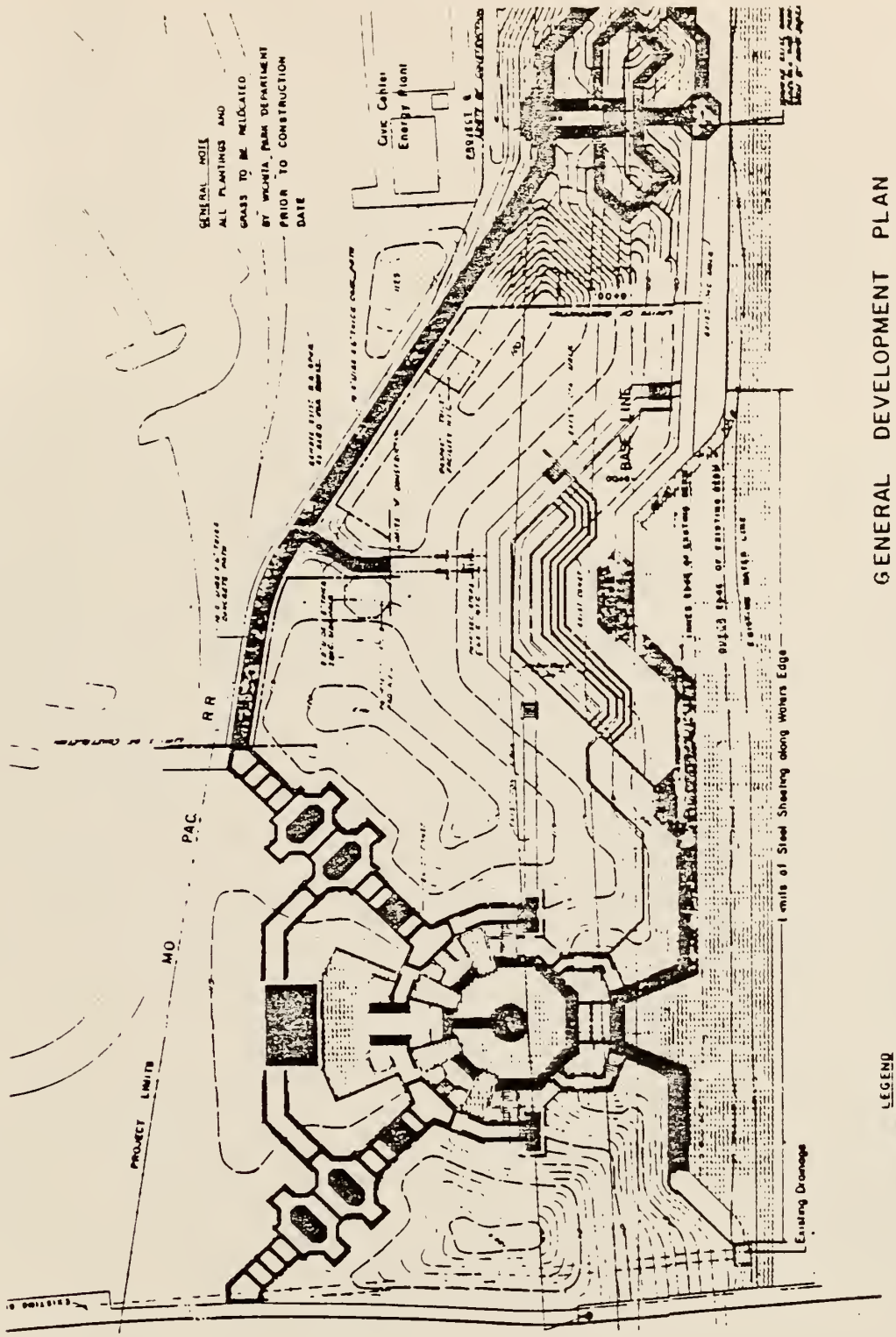


Fig. 3.3 Price Woodard Park site plan Source: Oblinger-Smith Co. Wichita, Kansas

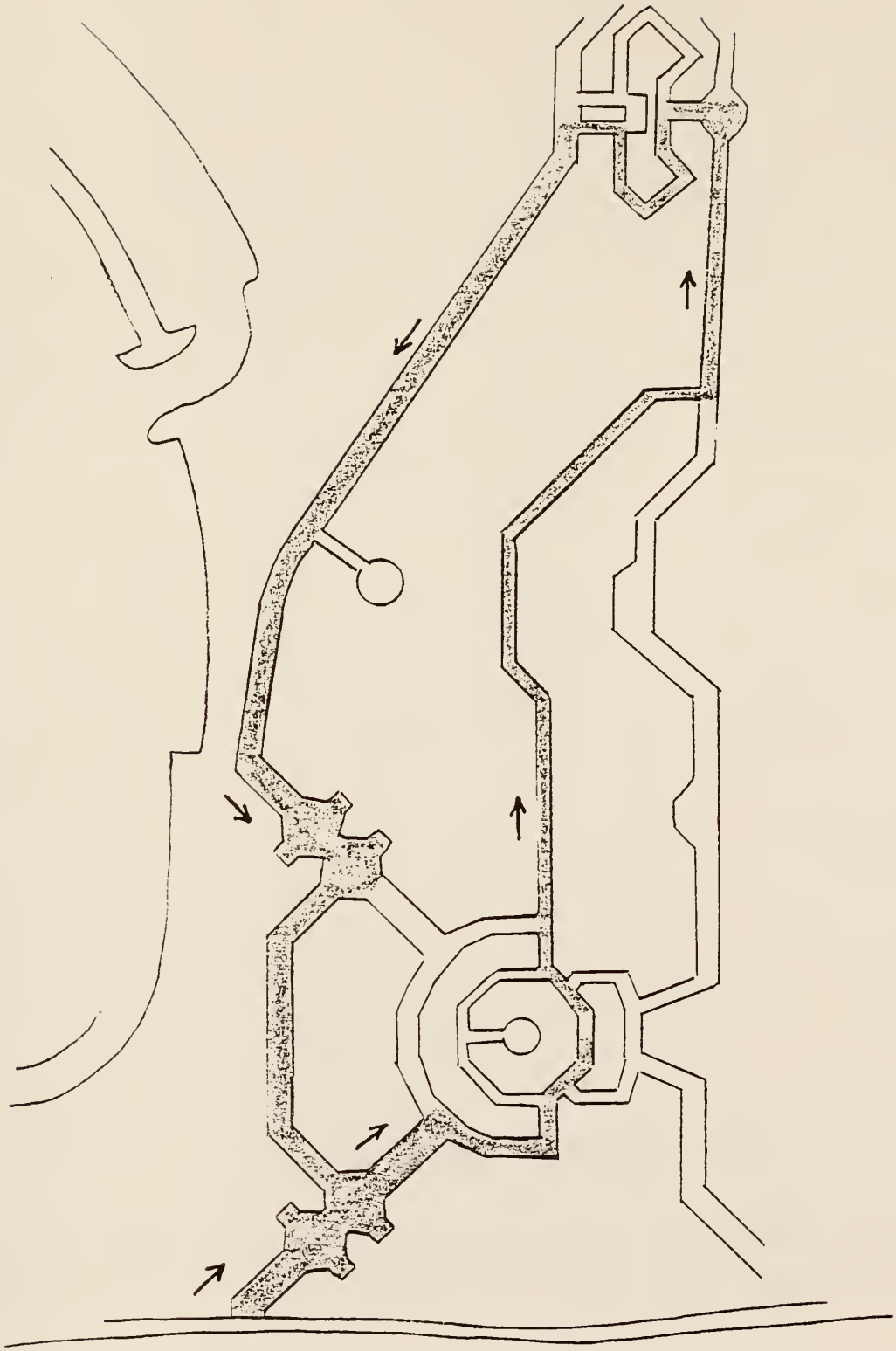


Fig. 3.4 Path selection map

experiential approach has been chosen as the mode of research. Site visits will be conducted by walking on a pre-determined path. Prescribed, standard pathways with viewing stations are typically used in landscape appraisal studies (Lowenthal 1967 & Litton 1973) and have afforded sufficient means for experiencing the resources and characteristics of a setting.

The site is divided into eight areas. Each area's limits are defined by major shifts in viewer orientation and/or abrupt changes in spatial form or environmental context. Each area has a sequential observation station known as a control viewpoint located at the beginning of each area. These viewpoints provide the analytical structure for recording sensory experiences (Fig.3.5, p. 42).

THE OBSERVER - The main scope of this research is method-orientated, as compared to statical analyses or comparisons of individual preferences and/or behavioral responses. Therefore large group sampling is not a objective of this study and the number of participants involved is small. However, using the responses of one viewer - the researcher, may be regarded as too subjective to adequately test the validity of the research hypothesis.

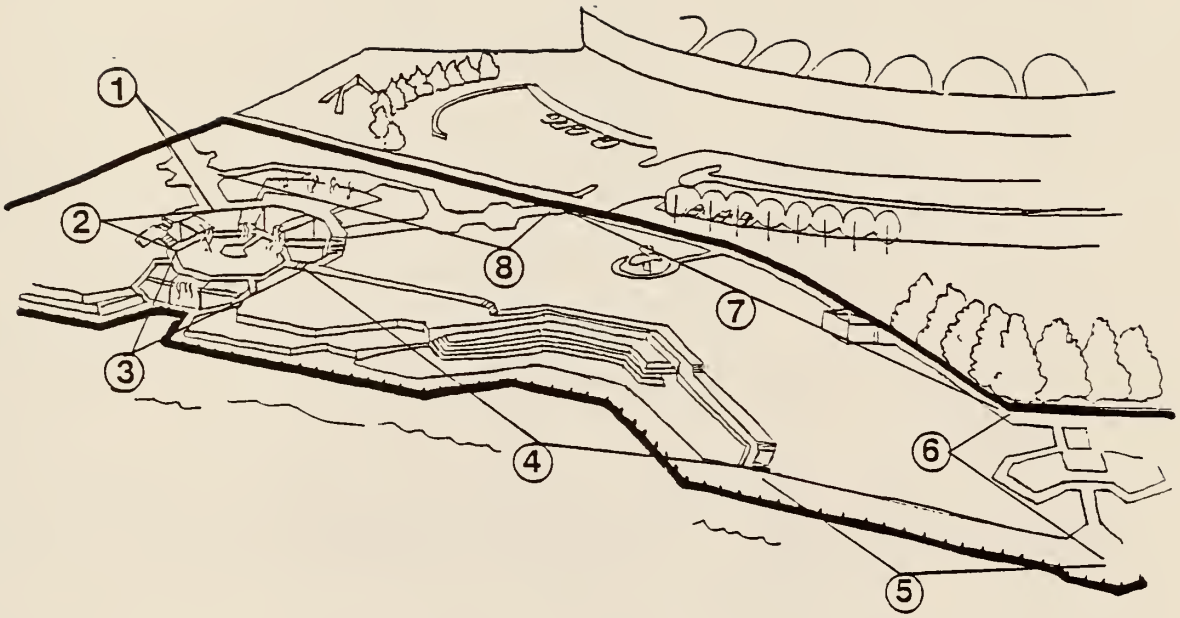


Fig. 3.5 Control area location map

Therefore, a test group of four has been organized. The number of this group is minimal in order to concentrate, in depth, on the study emphasis: development of methods for sensory data collection and illustration of that data by combination of various notation systems. This research is experimental in nature. This study could be applied in scientific research by the inclusion of large group samplings and quantitative types of analysis.

The group is composed of three individuals and the researcher. The participants differ in professional/ educational background: one has had previous training in environmental awareness, gained by a masters degree in landscape architecture and practices as a landscape designer; the second person is a housewife with a high school education; the third has a college education in fine arts and works in the industrial sector. This test group plays an important role in the research for they add a measure of objectivity in the form of a "collective image" (Lynch 1960).

SECTION TWO

RESEARCH PROCEDURE

The experiment contains two phases - the first involves a site visit and completion of the descriptive

checklist; the second half is the drafting of the notation system at a nearby location.

PHASE ONE - The experiment began by handing out, to each participant, a written copy of the research criteria (the descriptive checklist) and the analysis format (the notation system and symbology). This format is provided page 46. General questions about the material and procedures were discussed at that time and later when necesssary.

Each person visited and took part in the study solely in the company of the researcher. This way the researcher's full attention was given for answering subsequent questions and relaying instructions. This also prevented any subliminal suggestions that might have occurred had other respondents been present. The site was seen and experienced essentially during the same part of the day - the afternoon and under as similiar conditions as possible. Site visits started around 1:00 P.M., and the weather was basically the same for all occasions- sunny, temperatures in the 50's and a wind of about 5-10 m.p.h.

Initally, the viewers were walked from beginning to end on the selected path. This was done to give them a general feel for the site. Observations were recorded on tape throughout. The respondents were not intimidated by

the recorder. In fact, this enabled them to speak freely. The conversational flow was not broken and the researcher did not miss out on any important comments, as using traditional note-taking might have done. Next, identical description checklist packets containing the context of observation and sensory mode dimensions were handed out at each of the eight contol viewpoints (Appendix A, p.97).

After the data was recorded for all eight areas, the participants were given a copy of the final assessment - the image awareness and assessment dimension and questions. The phase ended by recording the viewer's overall impressions of the experience and thoughts about the use of the descriptive checklist.

PHASE TWO - The second part was the completion of the notation system. This procedure was conducted in an indoor environment so to have comfortable drawing space and drawing tools nearby. A procedural review of the notation system was given, along with a blank notation form (Appendix B, p.103). A photographic display of the path sequence was provided as a visual aid to help the participants recall specific park components (Appendix C, p.105). After completion of the notation, participants were asked for their general impressions and suggestions for improvement of the system.

RESEARCH CRITERIA

The criteria and content of the descriptive checklist was given to all respondents to read before their site visit. This contains a detailed description of each dimension and its' components. See Fig. 3.1 (p.34) for the outline form of this material.

1. CONTEXT OF OBSERVATION:

This dimension illustrates the basic components viewers percieve to form the dimensions of space (landforms, landscape features, structures etc.); viewer orientation and movement; the viewer's activity attitude; and the identity and location of major landscape elements.

SPATIAL COMPOSITION - This section depicts the visual content of each viewing area, such as structures, landscape elements and the spaces formed or defined by them. The elements chosen are only those required to provide the essential information for construction of the percieved setting. Therefore, the finished depiction is a simplification of the physical landscape.

VIEWER MOVEMENT - This section relates to the patterns of viewer movement and sense of direction. Movements such as, straight ahead, right and left 90 degree turns, circular motion, descent and ascent are noted as the activity occurs.

ELEMENT PLACEMENT AND IMAGE FUNCTION - This section includes the identification and location of any elements in the landscape, on or off-site that have qualities of high visibility or have the probability of evoking imagery about parts of the experience. These elements may function in one or more of the following ways:

* feature: an object or space, natural or built which dominates or is prominately situated within the site, and is considered a major intrinsic part of the design.

* activity node: this is a space into which one may enter/exit, is an area of concentrated use and usually has some type of spatial form (Lynch 1960).

* focal point: an object which is interesting or has an unusual attraction and is clearly distingished from its' suroundings.

* landmark: feature/object which functions as reference and/or orientation markers. It usually has a clearly defined form and is significantly placed in the landscape (Lynch 1960).

The elements chosen are noted in the control areas where they make the strongest impact on the viewer.

VIEWER ACTIVITY ATTITUDE - This section illustrates the viewer's physical attitude as they progress on the path. These activities may consist of walking, sitting (on benchs, grass, steps, etc.) standing, climbing (on site features) and reposing (on grass) or any combination. Even though the viewer will be following a prescribed pattern of movement throughout the experiment, the intent of this section is to evaluate observer preference for certain types of activity as if they were experiencing the setting at their own pace and leisure.

11. CONDITION AND CHARACTER OF SENSORY MODES:

This dimension defines and explores the various modes of contact the participant has within the physical setting. Sight, sound and smell are examined in the following manner - identification of source, duration of exposure, and qualitative evaluation of sensory contact.

VISIBILITY MODEL - This evaluates several aspects of the viewing experience:

* Viewshed type: This is a judgement to the amount of area seen from each viewpoint. The viewshed

relates to the relative visibility of features from the site's surroundings and is a basic indicator of visual quality (Jones & Jones 1977). Viewshed types are:

* vista: views of element(s) and beyond, view is enframed by partially enclosing natural or built features.

* closed vista: same as vista, except view stops at the element enframed.

* panorama: a setting which provides a sweeping view of the landscape, with no predominate visual obstructions. Views are distant.

* screened panorama: same as panorama, except that views are partially concealed by landscape elements located in the near to intermediate distance.

* Image viewing sequence pattern: This illustrates the viewer's approach and passing of the image elements previously chosen in the context of observation section. Views of each element are graphically expressed in several ways to how they are experienced:

* the degree of visual exposure - glimpsed or continually seen.

* distance relationship to the viewer:

  .nearby: details, color and texture are clear and sharply defined

  .intermediate distance: details are not as clear or sharply defined, individual features blend together, shape becomes more prominate

.far away: surface distinction is lost, emphasis is on form, outline and shape.

* sense of orientation: the visual relationship between the object and viewer. elements are either to the right, left or in front of the viewer.

* Visual focus: This determines whether the viewer's concentration is more likely to be on individual landscape elements or see the landscape as a whole - a composite of relationships, forms and activity. The three types of visual focus are defined as:

* focus on details: viewing activity is concerned with details, line, texture, color etc. of individual objects. Elements are usually located in the foreground.

* focus on overall views: focus is more on the overall shapes, forms and relationships between objects. Elements are usually located in the middleground or background.

* focus on both: area of attention takes into equal account both details and overall views.

* Scenic distinction: This is an indicator of visual quality. High scenic distinction may be attributed to collective or individual attractive features, vivid landforms and/or degrees of singularity (Smarden et al. 1986). Scenic distinction is rated from very distinct to very ordinary.

AUDITORY FACTORS - This relates to sounds the participant percieves in the vicinity and are typical to the surroundings. Sonic conditions and charcacteristics are examined in the following manner:

* Distance: The spatial separation between the viewer and the sound measured.

  * nearby 0-100 feet
  * intermediate distance 100-200 feet
  * far away 200 feet or more

* Intensity: The degree or level of hearing capacity.

  * soft: barely perceptable - conscientious effort has to be made to notice the sound.

  * normal: average range, comfortable to the ears, similar to conversation levels.

  * loud: very noticable and has the potential to become uncomfortable after long periods of duration.

* Quality: An attribute determined from auditory sensitivity.

  * enhancing: sound is informative, unique, and has a pleasing variety of tone and reinforces the imagery of the space.

  * neutral: sound is neither pleasing or annoying, does not affect the imagery of the setting in either a positive or negative manner.

  * detracting: sound is annoying and reduces the overall pleasure of the experience.

* Landscape sonic responsiveness: Depending on the landscape elements and spatial configuration, a setting may be responsive to sound or it may subdue and reduce sound intensity. For example, an alley way or other small hard-surface areas are potentially sonically responsive, as comared to spaces with high walls, dense vegetation or large landforms which tend to act as barriers to sound.

OFACTORY FACTORS - Smells can function as non-visual clues to the content of the environment. The smell of fresh bread can mean a nearby bakery and may recall to mind pleasing culinary experiences. Exhaust fumes smells are associated with pollution, thereby denoting a negative influence. In this context, smells will be assessed for their imagery value.

111. IMAGE AWARENESS AND ASSESSMENT:

This dimension defines and evaluates the quality of visual and non-visual stimuli as discussed. Sight, sound, smell and changes in physical awareness are assessed for the level of effect they have on the viewer. Observer judgement is based on the amount of interaction with

landscape elements, the depth of awareness, and personal association and symbolic reference to what they see and experience. The data from this assessment will be used to test the validity of the research hypothesis.

IMAGE STRUCTURE AND STRENGTH - This contains judgements as to how the sensory modes contribute to the experience of each area. Each sense is rated for its effect - be it positive/negative, strong or weak.

COMPOSITE IMAGE QUALITY - This is an assessment of the image-producing capabilities of landscape elements. It is considered from an overall perspective including all eight control areas and judged in retrospect after the walk is completed. The basis for evaluation is the vividness of experiences and the strength or weaknesses in the coordination of physical form and sensory stimulus. Areas that are considered highly memorable, represent positive imagery. Likewise, areas considered unremarkable generate the opposite evaluation - those inferior in quality and generally disliked.

SECTION THREE

ANALYSIS FORMAT - THE NOTATION SYSTEM

The form (Appendix B, p.103) is divided into eight control areas, same as in the descriptive checklist. In the space representing the context of observation dimension, the control areas are subdivided into thirty-five smaller sub-plots. They are characterized by progressive changes in viewer orientation; therefore, whenever the path angles off one or the other direction, creating a new sight line, a sub-plot is formed. The sub-plots are created to provide a clearer understanding and detailing of elements, spaces and movement activity as they are experienced. The other two dimensions - condition and character of sensory modes and the image awareness and assessment are a condensed version of the eight control areas. This controls redundancy and provides a more concise pattern of each environmental context. The form itself is read vertically, starting at the bottom and finishing at the top. Each of the three dimensions can be read separately or concurrently depending on the scope of analysis or desire of the reader. Two of the dimension categories have vertical center lines in their format to graphically portray the viewer's position on the site. The nature of image awareness and assessment dimension precludes that need.

NOTATION SYMBOLS

All the dimensions are notated with a series of symbols designed to illustrate the information gathered from the descriptive checklist. The symbols were individually designed by the researcher or chosen from various sources,ie. Halprin (1965) and Dreyfuss (1972). They are meant to lend themselves to meaningful associations. They are part pictorial and part abstract, depending on the data illustrated. A legend on the notation format describes each symbol. The symbology process for each dimension is described below:

1. CONTEXT OF OBSERVATION:

As previously mentioned, this section is subdivided into thirty-five individual frames. The spatial context for symbol placement is created from each individual frame being bisected into three sight/distance zones - the bottom third is the foreground; the center third is the middleground; and the upper third is the background. The symbols in this section are transferable to the other dimensions as needed to notate other aspects of the experience (Fig. 3.6, p.56).

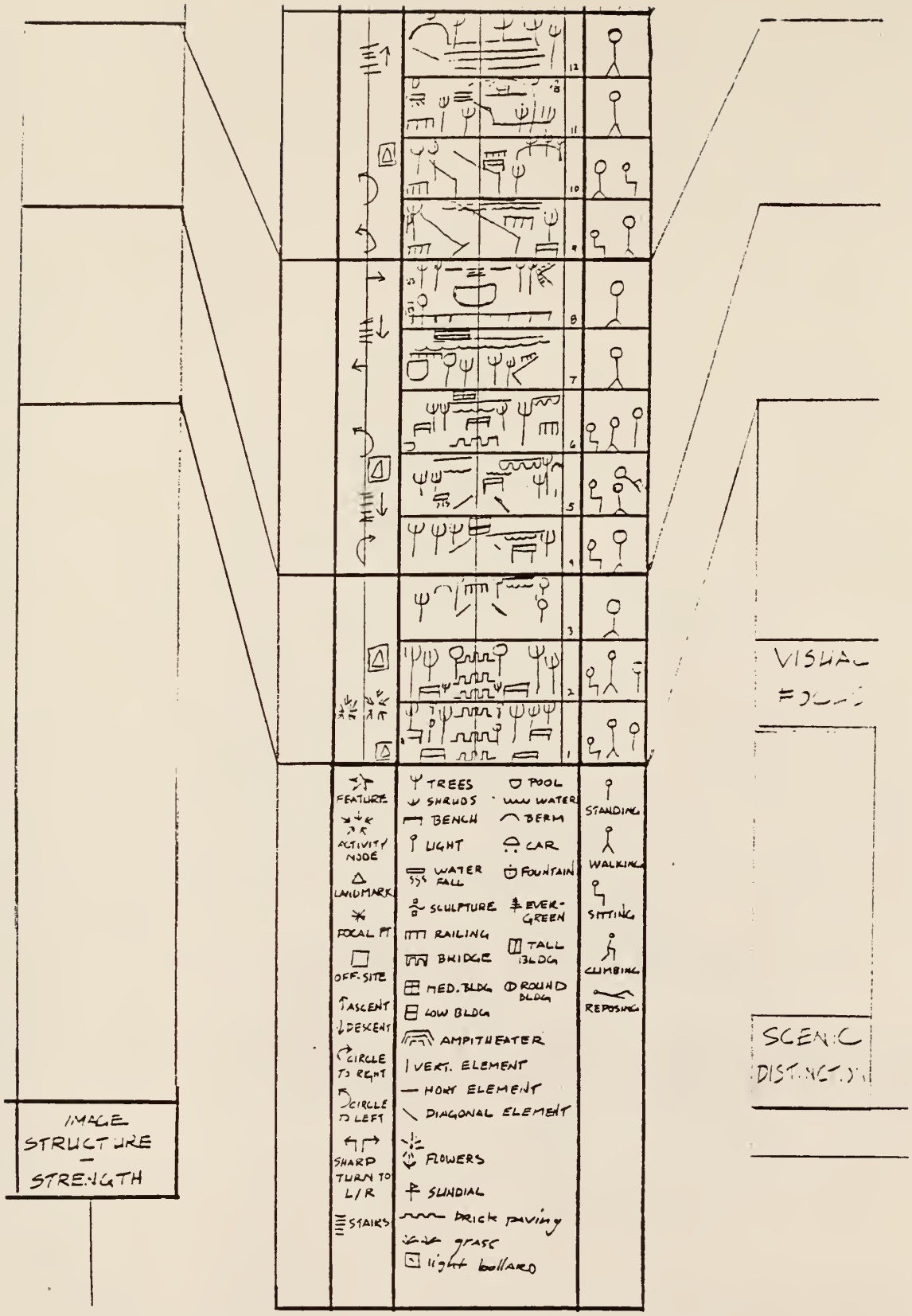


Fig. 3.6 Notation form: Context of observation

11. CONDITION AND CHARACTER OF SENSORY MODES:

VISIBILITY MODEL -

The symbols in this section are more abstracted due to the non-physical nature of the contents. The visual focus illustrates the scope of viewing activity and scenic distinction category depicts the visual quality of each control area. The viewshed-type symbols are represented by different visual limits approximating 45 degree vistas to 180 degree panoramas.

Image component are placed in one of three category frames - feature/activity node, landmark, or focal point. A pictoral symbol of the actual element is drawn in control area frame where it was percieved to be located. A purely abstract symbol is drawn representing each element on the vertical viewing line. Closely stacked symbols mean the element is constantly viewed, large gaps between the symbol means there is a break in the visual continuity. A dashed line to the right or left of the symbol represents a glimpse of that element. Image distance relationships are depicted by an enlarging or reducion of symbol size. Orientation relationships are shown by placing the symbol to the right, left or on both sides of the viewing line (Fig.3.7, p.58).

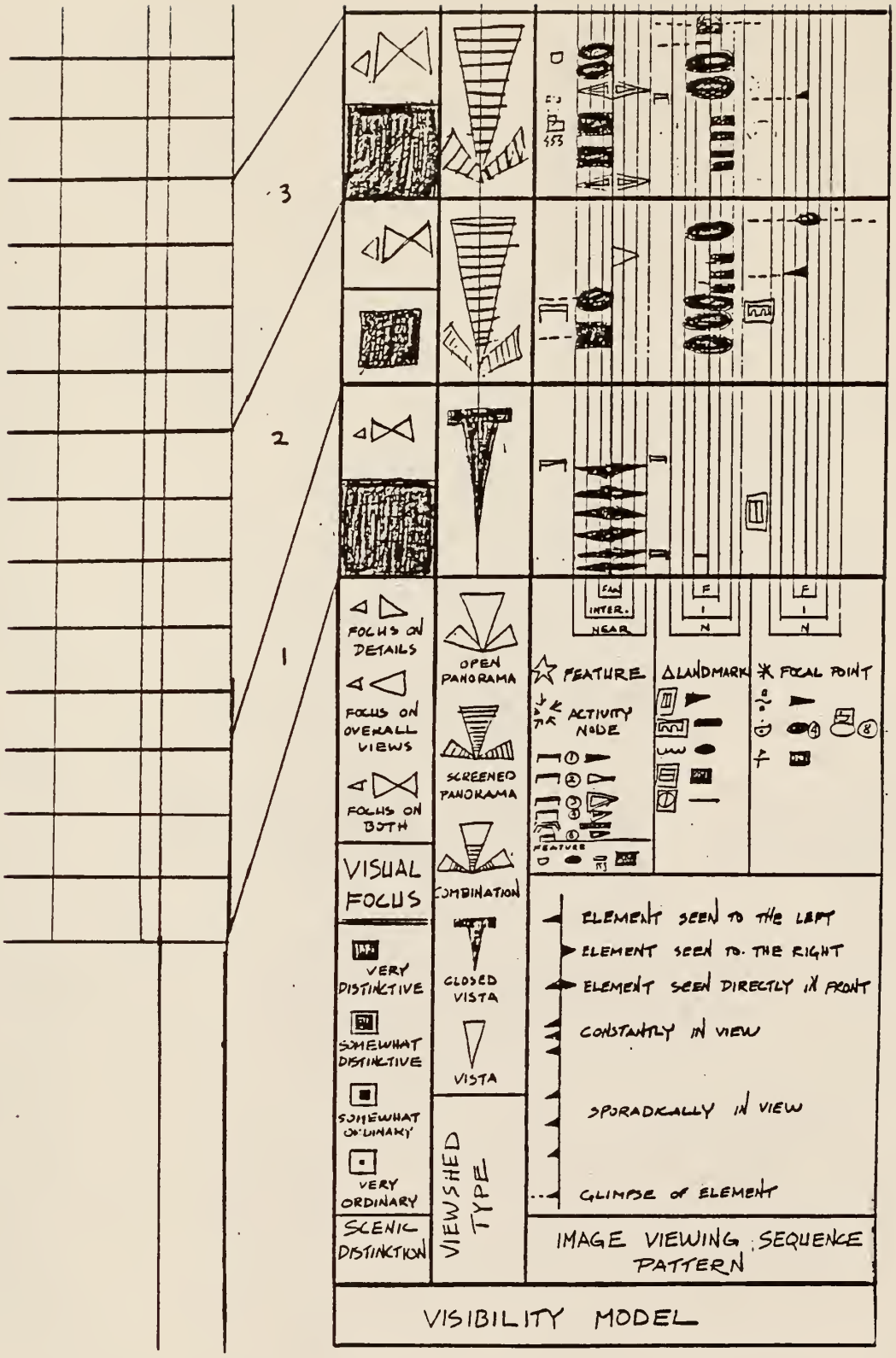


Fig. 3.7 Notation form: Condition and character of sensory modes - The visibility model

AUDITORY FACTORS -

The physical source of sound is illustrated by a pictorial symbol. More abstracted symbols portray the various conditions and quality. In a way similiar to the context of observation section, each of the eight control area frames are sub-divided into three parts: the bottom represents entry to that area; the center is the mid-part of the experience; and the top illustrates the departure of that area. Symbols depicting each sound source are placed in the section relating to the point of closest contact. Either side of the souce symbol is bracketed by another symbol which shows the distance factor. Placed above the source symbol is a quality indicator denoting if the sound is considered to enhance, negate, or have a netural effect on the experience. Below the source symbol, the intensity is noted - loud, normal or soft. A separate sound presence time line shows the overlapping and continuity patterns of each sound (Fig.3.8, p.60).

OFACTORY FACTORS -

Placed within the auditory section, the properties of smell are noted. A pictoral symbol is located in the frame where the smell is most noticed. The quality of the smell - enhancing or detracting is represented by a symbol placed next to it (Fig.3.8, p.60).

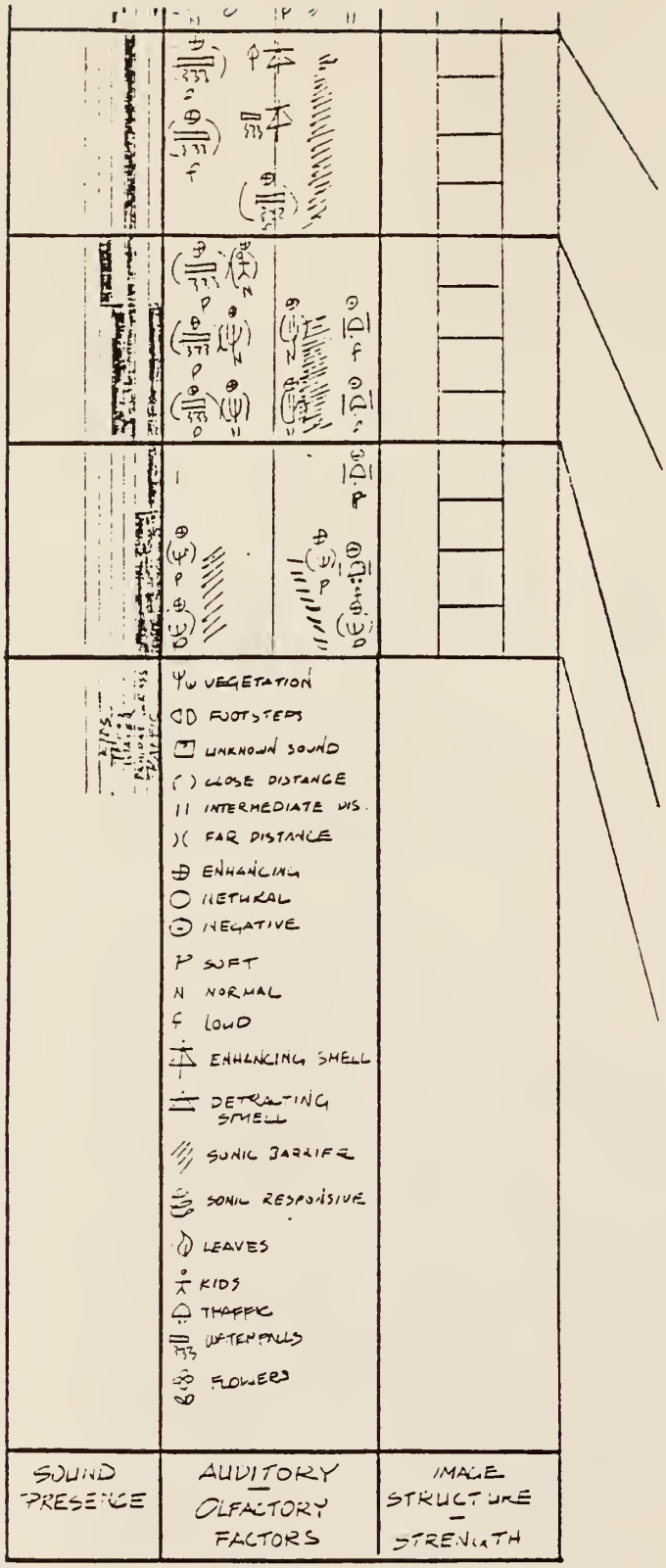


Fig. 3.8 Notation form: Condition and character of sensory modes - Auditory and olfactory factors

111. IMAGE AWARENESS AND ASSESSMENT:

In this section, the varying degrees of sensory influence and its' positive/negative qualities are drawn. In the image structure category, each sense - sight, sound, smell and physical changes are judged for their role as image-producing components. This is repeated for all eight areas. An abstract symbol illustrates the influence of the sense - from an extreme one to none; and depicts whether the influence was a positive or negative one.

The composite image quality category contains two symbolic opposites - memorable/high quality and unremarkable/low quality. The appropriate symbol is placed in the individual frame(s) where that assessment is considered most intense. Shading is done on either side of the symbol to represent the limits of that assessment (Fig.3.9, p. 62).

This notation system as its predecessors, take a certain amount of time to learn how to use and can be difficult to read in the beginning. However, it does serve an important purpose, as best described by one of the pioneers in the field. "It facilitates insight into the structure of the experience and promotes the rhythmical organization of (environmental) components" (Thiel 1962, p.228). Insight and organization are the key words here, both are necessary for any kind of successful environmental analysis.

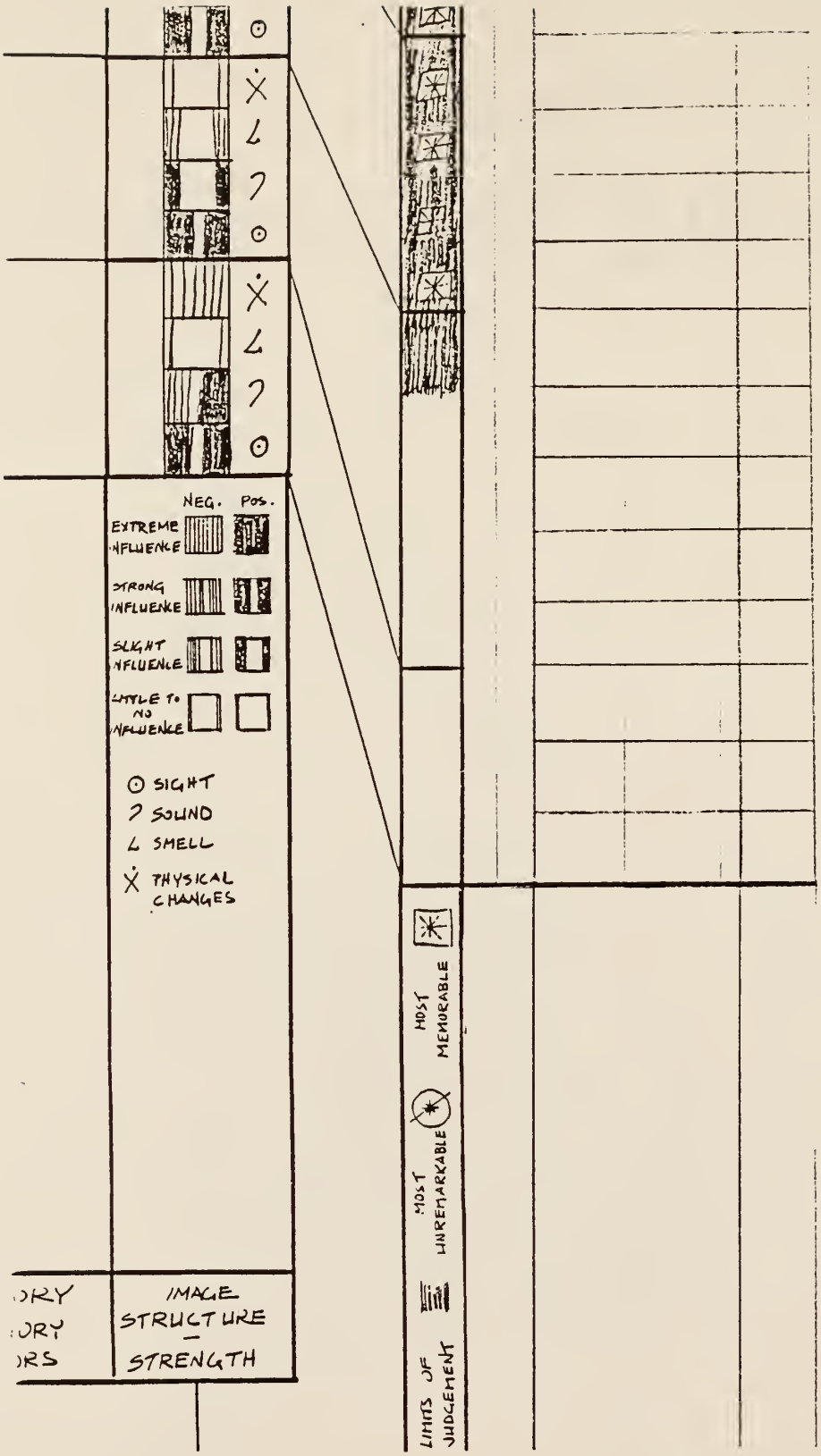


Fig. 3.9 Notation form: Image awareness and assessment

CHAPTER FOUR

RESULTS

The results of this research have been organized into two sections. The first section discusses the descriptive checklist which was used for on-site evaluation of the study area. It contains the viewer's responses to the checklist components, the problems encountered and verbal descriptions of site experiences. Section two compares and discusses the results, as gathered from the checklist, to the stated research hypothesis (Chapter 3).

SECTION ONE

In this section, the findings are composed from viewer's contact and response to environmental attributes and elements within each control area. To clarify future references to any one or all eight areas, a short description is provided to illustrate "in essence" the context of each space: (see Appendix C, p.105 for photographic display).

> Area 1 - This is **the entry point** to the park. One is equally exposed to the elements of the city and park. The wind is brisk and the sun, bright. Traffic zooms by on the adjacent street. The entry ground

plane is a brick/concrete walk lined with a series of pin oaks enframing distant glimpses of the river. Benches are located in the several node-like spaces and provide some semblance of privacy due to surrounding clumps of pampas grass.

Area 2 - A a **transition** occurs here from a gentle stepping descent down the riverbank. This change in elevation allows one to appreciate the more park-like setting. The space is tree-canopied and shady. A view of the river is enframed by trees and berms on both sides. The pool and its' waterfalls are more visible and audible.

Area 3 - This space is **a separate enity** unto itself. It is defined by waterfalls on one side, the pool in the center and the river on the other. The lower elevation screens the sonic and visual cacophony of the city, thereby directing one's attention to the attributes and activities in and around the pool. Options range from interplay with the water to sitting on the nearby benchs and enjoying the view.

Area 4 - This is **the promenade of the park**, which is a long walk extended throughout the central section of the site. Initially, the gently rolling berms on the upper side act as a pedestal for the park's sculpture. Beyond that, the berms direct one's attention down to the river and the ampitheater space where programmed activities occasionally take place. There is a feeling of openness contrasted with a sense of enclosure created by walking under the trees which line the edge of the ampitheater.

Area 5 - This is **the river walk** since the path is only a few feet from the water's edge. Views are expansive, the wind is zepher-like and the sun's brightness glitters on the water.

Area 6 - One winds up a narrow path here to **the landing.** This higher elevation suggests a visual survey of the river and the upper opposite bank. There is an interesting abundance of vegetation which is the home of crickets and other urban wildlife. The sounds of the city drone distantly in the background.

Area 7 - This is **a walk on the city side.** Another major transition occurs here, from the park to a more urban-like setting. One faces the city skyline for the first time and has considerable exposure to

urban paraphernalia - parking lots, streets, cars, office buildings, etc. The only interesting focal point is the close proximity of the park's scultpure.

Area 8 - This is the re-entry to the park. The elements and sounds are similiar to area 1, except with the addition of a fountain and water jets. It creates a visual and auditory effect not present at the entry point.

DESCRIPTIVE CHECKLIST

1. CONTEXT OF OBSERVATION - spatial composition, viewer movement, viewer activity attitude, image location and function.

The three respondents, including the researcher, considered the spatial composition section one of the most easily understood aspects of the methodology. The ease of comprehension was mainly due to the fact that the criteria dealt with real physical objects found in the landscape, ie. street furniture, berms, etc. Respondents were instructed to select the elements they perceived to compose the space of each area. Most of the objects selected were similiar in nature. It is interesting to note that all respondents noticed landscape details, such as paving materials and patterns, lighting fixtures, and amenities like flowers and the mixture of plant material. This attention to detail was assumed to have importance to the individual and the researcher who had landscape training, but details were also appreciated, though not to

the same extent, by the two without prior environmental training.

The three observers noted, on a consistent basis, one element that the researcher considered inconsequential as a spatial definer - the lamp posts. It was the reseacher's contention that since the majority of the lights were located next to trees and blended into them, the lights wouldn't be very noticeble. However, two of the observers considered otherwise. They mentally pictured the site visited at night, when the lights would indeed become important and striking spatial definers. This compared to the other observer who saw the lights only as landscape objects. Many times throughout the site visits, all the viewers speculated about the various physical and experiential changes that would occur from seasonal and daily variations. This points to the need for designers to keep in mind the effects of a design experienced under different circumstances and times of the year.

One analysis component found to be repetitive was the plotting of viewer movement on the path. Since each respondent traversed the same path, this became standardized information. Therefore a one-time only assessment is needed. In the future, this component should only be used repeatedly if the participants walk on different paths.

The results of the viewer activity attitude showed a wide range of activities, from lying in the grass to climbing on site elements were possible and desirable. All areas except area 6 and 7 provided ample opportunity to experience all types of activity and degree of exertion. Walking was the main activity perceived in areas 6 and 7, because compared to the other areas which had an abundance of comfortable and convenient sitting possibilities, ie. benches, ledges, berms etc., area 6 only had one bench to sit on and 7 none. From each observer's response about area 7, all indicated no desire or inclination to relax there.

In the context of observation, the most problematic aspect was the difficulty the three respondents had in understanding the image component concepts - features, activity nodes, landmarks and focal points. Although this was only a slight problem for the one respondent and researcher who were familiar with landscape architecture terminology, the other two needed several elaborated explanations for each component.

11. CONDITION AND CHARACTER OF SENSORY MODES - visibility model, auditory/olfactory factors.

* **Visibility Model** - viewshed, image sequence patterns, visual focus and scenic distinction.

Some parts of this section were easily understood and some were hard to understand. Initially during site visits, it seemed the visual focus and scenic distinction components were easily comprehended by all and required a minimal amount of subsequent explanation. But, the results showed that a respondent (one without prior landscape training) may have had a misconception of scenic distinction, for the same assessment was consistantly chosen for each control area, compared to the other observers who chose a wider range of scenic distinction ratings.

The terminology problem showed up again with a different respondent concerning viewshed types. In the beginning, the three respondents had problems understanding definitions, which improved as the experiment progressed. Even so, the results revealed one observer chose the same viewshed over and over. Upon inquiry, the individual didn't relate any problems with the terms; even so the other respondent's ratings were more varied. The similarity of these misconceptions emphasize the need for futher refinement and clarity to the terminology used, especially if non-trained observers are to use this system.

There were no significant problems with completing the image sequence pattern section, with the exception of the distance factor because of difficulties in judging

lengths of 100 to 200 feet or more.

* **Auditory/Olfactory Factors** - distance, intensity, sonic quality and responsiveness.

This section was fairly easily understood by everyone and completed except for sonic responsiveness, which was a problem for all involved. The two viewers with no prior training had the most trouble with it. The researcher feels that the concept of sonic resonance was not the problem; it lay in trying to distinguish between a sonic responsive landscape and a sonic barrier-type landscape. Because of this lack of understanding, it resulted in a tendency for one observer to refain from making any judgement at all. Future use of this component should contain a revised and condensed one-term-only description.

Both natural and man-made sounds were perceived on the site. They included traffic sounds, water, vegetation, insect life and people. In all control areas, traffic sounds were judged detracting or neutral in cases where traffic was thought to be a low background noise, ie. areas 4,5 & 7. This correlates with Southworth's findings where observers considered traffic not to be particularly detracting if the source was located some distance away.

In the areas where water was present, the participants always believed it to be enhancing and where it was most intense, water had the ability to mask out any other sounds that would have been noticed otherwise. For example, in area 3 with the waterfalls running, other sounds were totally screened out, including traffic which was percieved a dominate sound in the areas preceeding and following it.

Overall, total sound presence was strongest in areas 1,2,3 & 8 due to the intensity of water, vegetation and traffic sounds. Areas 4, 5, 6, & 7 were deemed most quiet and composed of low intensity sounds ie. cars, leaves, voices and insects. Even though these areas were farthest removed from street activity, traffic was always present in the background.

The wind played a large role in creating and amplifying sounds. All observers noticed the strong auditory effect wind had on shrubbery and trees. Because of their natural characteristics, the site plantings of oak and sycamore trees and pampas grass promoted interaction with the breeze. The large, dense tree leaves were heard rustling on the branches and on the ground as they tumbled across the pavement. One observer considered it an auditory symbol "of winter coming on". As a fall seasonal characteristic, oak and sycamore leaves have a tendency to stay on the trees some time after other trees

drop theirs, thereby prolonging the "fall" imagery. The profuse plantings of pampas grass also created swishing-like sounds somewhat harmonious to flowing water.

The wind carried sounds long distances and when the wind changed directions, observers noted how their awareness of those sounds changed as well. It's a well known fact sounds carry over water and since the park is next to the river, this phenomena was present where traffic was judged to be of normal intensity (areas 4, 5,& 6) even though its source was a considerable distance away on streets from the other side of the river.

Olfactory sensations were minimal through out all the experience. When smells were present, they orginated in different areas and from various souces. Traffic fumes were noted in area 1, which coincided as being the closest point of contact with cars. The smell of water and decaying leaves were sensed by the pool. One participant considered it a pleasant experience, reminiscent of "the smell of fall". A fresh air scent was prevalent in area 5, presumably due to the effects of wind blowing across the river. Of course, the attractiveness of both these experiences would be dependent upon the degree of water quality. Area 6 was the solitary space planted with flowers, but only made an olfactory impression on one respondent. In short, smell sensations were infrequent and equally composed of pleasant and unpleasant connotations.

111. IMAGE AWARENESS AND ASSESSMENT - image structure and strength, composite image quality.

There were no major problems with participants understanding this section. However a few modifications need to be made in the image structure and strength category. The positive/negative aspects of sensory factors which have little to no influence were found to be unnecessary. In most instances it was a moot point to determine the qualitative aspects of image factors with little influence. Also the three respondents had problems understanding the physical response factor. This may be because of terminology that wasn't explicit enough or to a lack of obvious environmental conditions on the site that affected body sensations.

The composite imagery section provided a synopsis of the areas that contained strong positive and negative qualities. The results from this are used to test the hypothesis of this study.

SECTION TWO

RELATIONSHIP TO HYPOTHESIS

The intent of the research hypothesis was to discover if similiar responses to a variety of sensory stimulus would elicit strong (negative/positive) images of the space experienced. Table 4.1 (p.73) shows findings

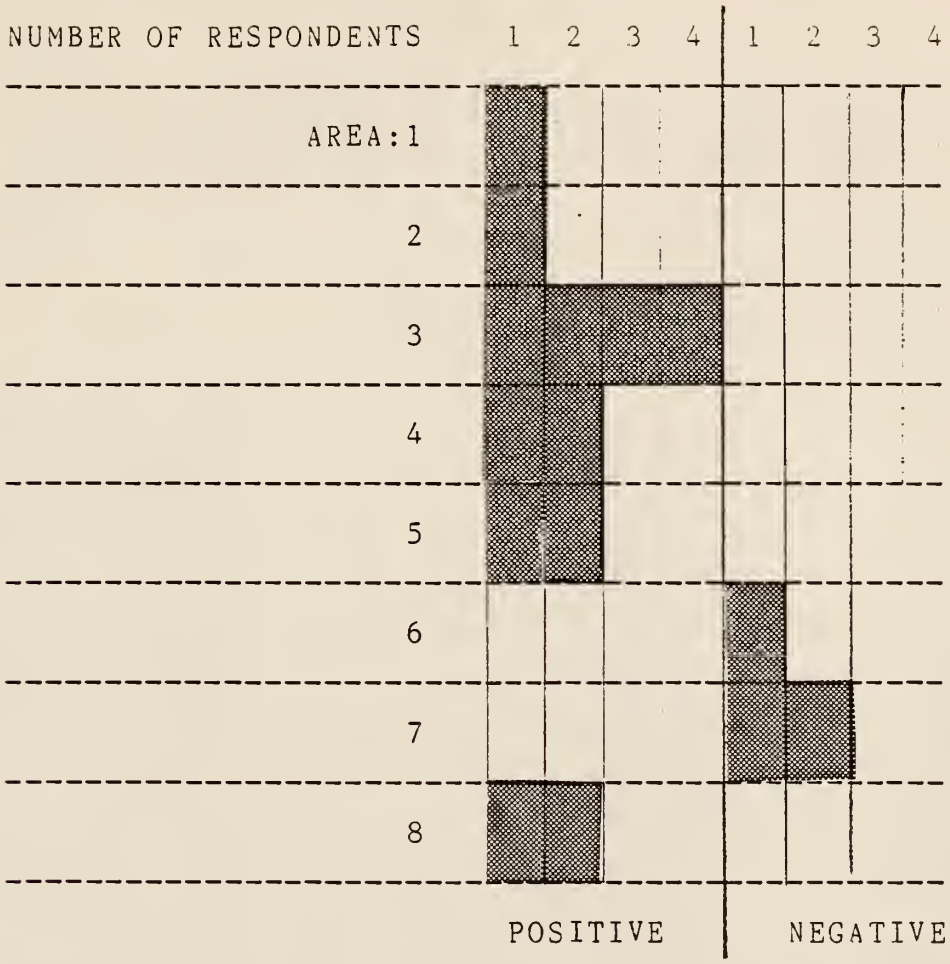


Table 4.1 Quality assessment of the eight control areas

from the composite image quality section and open-ended questions.

This table illustrates the actual number of times each area was mentioned by one or all respondents to it's positive or negative image quality. Areas 1,2,3,4,5 & 8 had one or more positive evaluations and were considered

places where experiences were most remarkable and memorable. Area 3 received the highest recommendation from all four respondents followed by a favorable judgement, by two observers each, for areas 4 & 5 & 8. Other areas had singular mentions. Areas 6 & 7 contained the most negative factors and were assessed by one or more observers as being unremarkable and disliked experiences.

POSITIVE FACTOR CORRELATIONS

Area 3 is used to illustrate the hypothesis of viewer positive response patterns of similarity, since it received the highest rating in image quality. The following is an analysis to what contributed to this quality:

Three of the respondents considered the pool and waterfalls a multiple image component - a feature, focal point, and activity node. In this context, observer's related how the space was thought of as an important place, "the heart of the park" and area where activity was most likely to occur. Its' architectural composition - the semi-enclosed pool space, surrounding boardwalk, waterfalls and "floating" deck were noted as being different and visual interesting; all of this is reflected by the high positive scenic distinction rating given to the area by all of the participants. The space provided a

sense of enclosure, physical comfort and enframed views of the river and surroundings; it was also described as a place of refuge from "the hustle and bustle" of city life. This area had an enhancing auditory quality because of the "soothing sound of water". Three of the participants considered this space the most sonically responsive, presumably due to the waterfall sounds reverberating off the spatial configuration.

Focus of attention concerning elements in and out of the space were evenly divided. Two respondents paid more attention to details and the other two focused on overall views. This reflects viewer comments on the above mentioned architectural detailing and three respondent's choice of screened panorama as the predominate viewshed.

Overall, all observers felt the essence of imagery was formed by extreme and strong positive views. A total of three judged sounds factors as having an extreme and strong positive influence. Three observers considered smells to be of little consequence having little to no influence. Each respondent had a different assessment of their physical response to environmental conditions. This diference ranged from extreme positive to a slight negative influence. Examples of areas 3 & 7 descriptive checklist responses are provided (Tables 4.2, 3 pp.76,79).

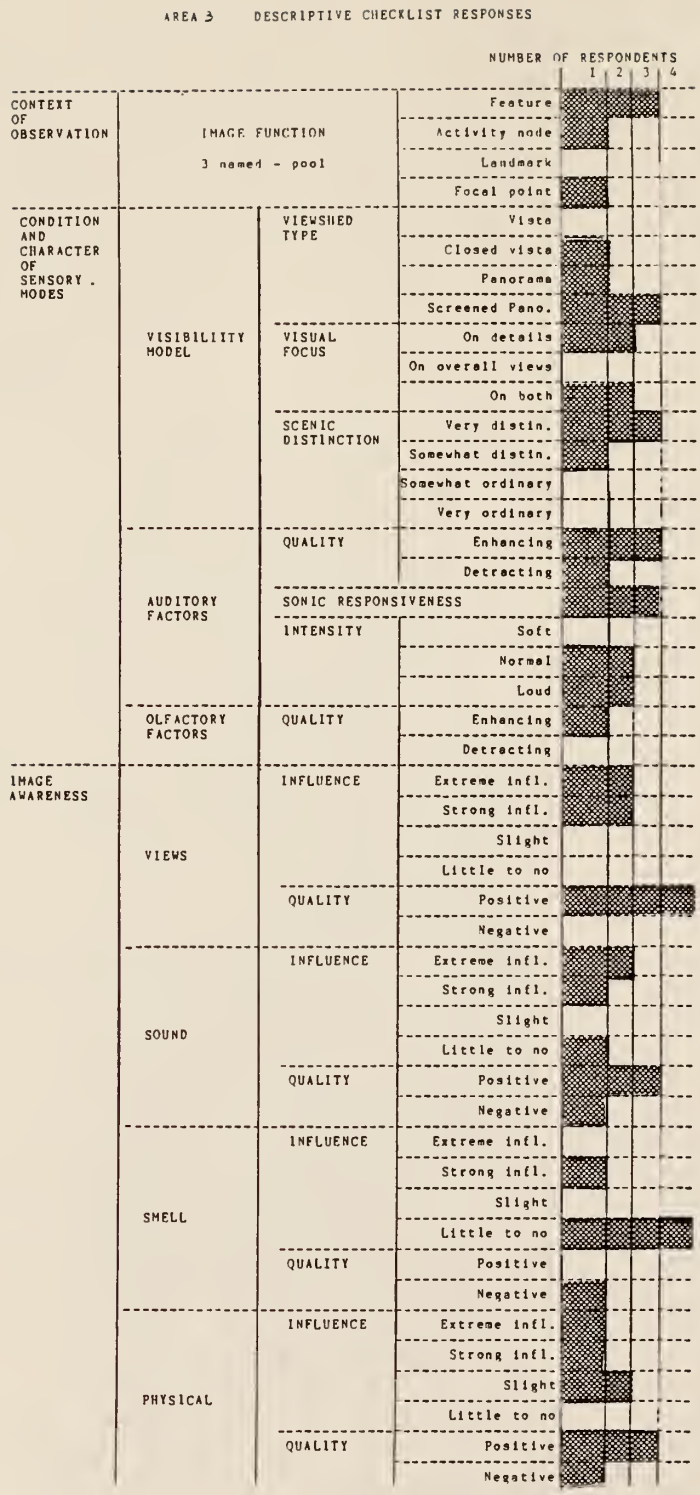


Table 4.2 Area 3 - Descriptive checklist responses

NEGATIVE FACTOR CORRELATIONS

Two of the respondents, the ones with prior landscape training, actually noted on the checklist, areas 6 and/or 7 as having some poor image characteristics. The other respondents did not consciously name those areas on the list but achieved the same effect by giving somewhat similiar negative descriptions.

For area 7, the only image component noted was the off-site structure of Century 11, which was considered a landmark. Compared to the descriptions about the pool in area 3, the fact that Century 11 was not a direct part of the park and only served one image function, limits its' importance or impetus towards stimulating any activity or emotional response. Three of the respondents saw elements and views in and off the site enframed by a closed vista. This also led three out of four viewers to visually focus on details compared to overall views. These aspects created a base for visual expectations not met. Many comments about the visual content related to the unscreened parking lot and neglected grounds maintenance. Buildings and cars were also quite conspicuous compared to the trees, benches and shrubbery prevailent in the previous and subsequent areas.

Everyone also sensed and commented on the poor sense of transition, "the feeling of leaving the park and

entering the parking area", and "being on the dividing line between nature and the city".

Sound quality was divided, two respondents judged it to have a slightly negative influence because car sounds were more intense compared to area 6; the other two thought sound quality had a slightly positive influence since they percieved, more or less, the rustling tree leaves of the nearby sycamores and were conscious of the relative quiet in the first part of the area. Three observers considered smell factors to be non-existent and three also had little to no physical response to environmental conditions, except with one statement noting the windiness of the area due to its higher, exposed elevation (Table 4.3. p.79).

The negative qualities associated with area 6 mainly had to do with one respondent's comments about the path configuration, describing its "constrained, abrupt turns" were unlike the other area's elevation changes which were, according to another viewer, "excellent solutions to grade changes" which "let you go with the flow". However this one shortcoming was overshadowed by the more positive experiences. There was interest in the nearby variety of plant material, the seating space furnished pleasing panoramic views of the river and because of the waterfall across the river and the nearby crickets, sounds had a more naturalistic quality.

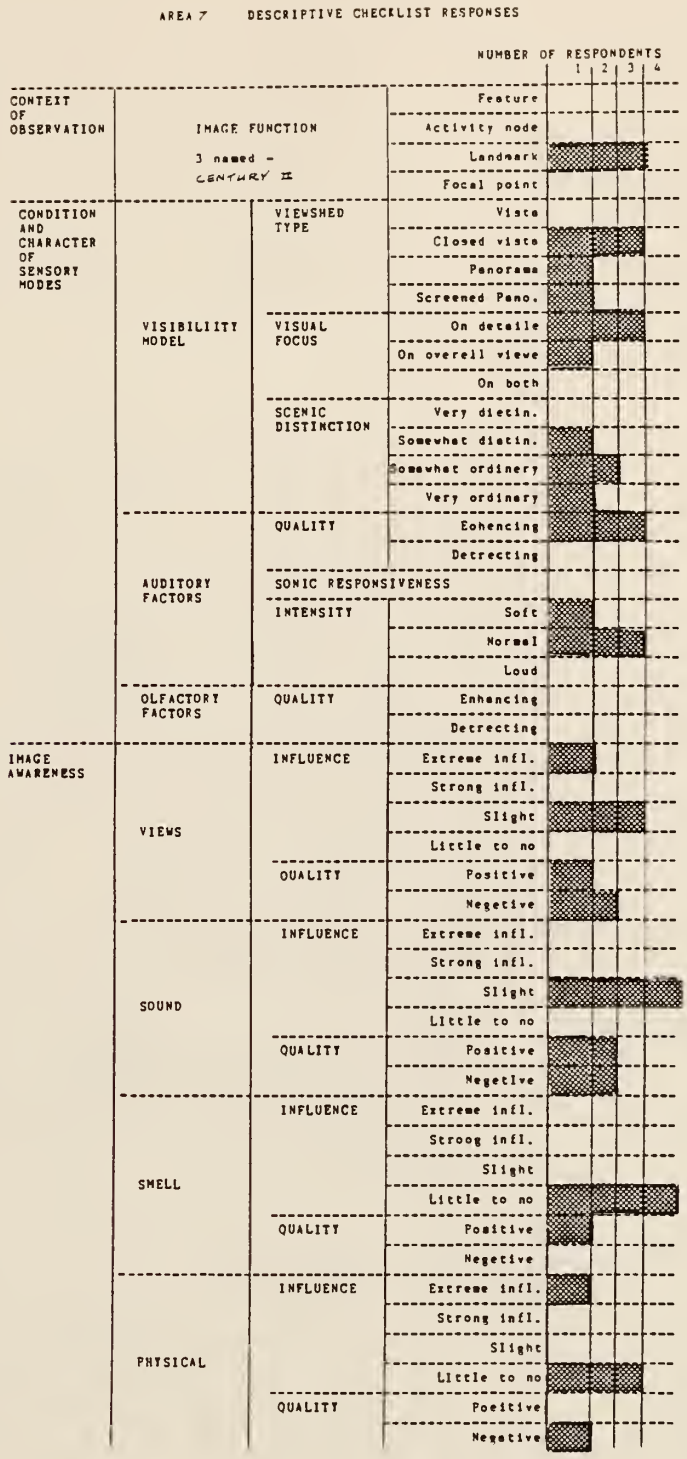


Table 4.3 Area 7 - Descriptive checklist responses

CHAPTER FIVE

RECOMMENDATIONS AND CONCLUSIONS

The intent of this research was to define and evaluate visual, auditory and olfactory senses in the manner they are used to formulate the image of an urban experience. The descriptive checklist was devised as the tool to collect the data. The notation system was designed to graphically illustrate it. The preceeding section gave an overview of the results generated from these procedures.

The contents of this chapter follows the subject outline as in chapter 4. Section one contains suggestions for the descriptive checklist; section two discusses conclusions derived from the use of the notation system; in section three, conclusions are drawn from the research hypothesis concerning positive and negative correlations; the last section contains research and design implications.

SECTION ONE

RECOMMENDATIONS FOR THE DESCRIPTIVE CHECKLIST

Though the three respondents were not prone to admit it, the researcher feels the biggest detriment to

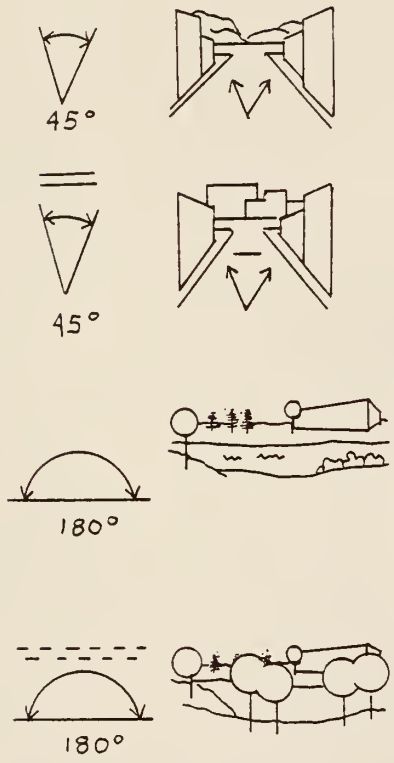
the checklist was the time factor. An average of four hours were spent completing the list, almost reaching the bounds of tedium. Even though there were no direct comments made about the length, all viewers spoke how involved the list was due to the number of components examined and to the depth of material covered.

One component found to be unnecessary and extraneous was the recording of viewer movement. It is only needed if the viewers use different paths, otherwise the information would be the same for all and only needs to be illustrated once on the notation form.

A recurring issue was understanding some of the terminology. For the most part, there was always some initial confusion, which can be attributed to lack of familiarity. However as highlighted by the various comments and the results, four terms were, more or less, consistently misunderstood. These are: viewshed types (vistas, closed vistas, panoramas and screened panoramas); sonic responsiveness; physical response to environmental conditions; and the image components (focal points, landmarks, and features). No one had trouble understanding the activity node term. Improvements to these problems are as follows:

Since the misunderstanding of the viewshed terms related to one person only, the problem is not as widespread as it is with the other definitions. A

solution to this would be to supplement the explanations with graphic illustrations, a plan view and perspective of each viewshed type (Fig. 5.1).



* vista: views of element(s) and beyond, view is enframed by partially enclosing natural or built features.

* closed vista: same as vista, except view stops at the element enframed.

* panorama: a setting which provides a sweeping view of the landscape, with no predominate visual obstructions. Views are distant.

* screened panorama: same as panorama, except that views are partially concealed by landscape elements located in the near to intermediate distance.

Fig. 5.1 Viewshed description and illustrations

The physical reponse to environmental conditions term may be better described and understood by considering it as such:

> a condition or activity where an individual acquires heighten awareness of atmospheric phenomena, ie. temperature variations, light/dark contrasts, wind etc. or is made conscious of extreme changes in personal movement patterns, ie. tempo, ascent/descent, orientation etc. The recognition and memorability of these body sensations become one type of perceptual experience which contributes to the image-building process.

The sonic responsiveness definition would provide more clarity if its two aspects - responsiveness and barrier, were combined into one definitive term called sonic resonance described as:

> the dual auditory effects of the intensification and enriching of sounds within a space and the reduction or masking of sounds outside the immediate confines of the space. This effect is created by a spatial arrangement constructed from closely spaced walls, structures, landforms or other solid material.

Instead of redefining the image components, it would seem appropriate to consider this problem from another standpoint. The image components as defined did not seem to have as much bearing in the small-scale confines of the park as the components may have had if used in their original macro-scale context. Instead of automatically asking respondents to select landscape elements which fit into a defined category they may or may not understand, a better approach may be to ask participants to list objects they find to be visually distinctive or respond to in terms of personal meaning or association.

This method was used by Harrison (1972) to develop base imagery maps for a large city. His study collected an array of factors which were categorized into six main "components of imagery" and were directly applied to Lynch's city forms - paths, districts, nodes, and landmarks. A similiar approach could be used, except instead of relating the descriptions to Lynch's urban

elements, an analysis of the collected data would, hopefully, lead to a new and different set of imagery components more characteristic of a micro-scale environment.

An aspiration of many environmental perceptions studies is to increase the general public's and designer's sensory awareness of the environment. To whatever extent this is achieved, the hope of this study was to add another positive step towards intergrating a little, previously considered dimension in the experience and design of public spaces. The respondent's closing remarks on the descriptive checklist illustrate one small way this objective was achieved. One felt an "increased awareness of the surroundings"; it gave another viewer "a new way of looking at things", and for the last one, it was "an enlightening experience which gave one a greater appreciation of parks and the surroundings".

SECTION TWO

CONCLUSIONS FROM THE USE OF THE NOTATION SYSTEM

There were no significant problems in notating the context of observation section. The instructions for illustrating this were easily understood and carried out. The ease of this may be, in part, due to the adaption of

Halprin's "motation" system. The general drawback to this section and the system as a whole was the time factor. It was a very long and consuming process, with average time of completion taking about six hours.

Some difficulty was encountered in notating the condition and character of sensory modes. The image sequence pattern was intended to provide, as the name implies, a visual, sequential pattern of important elements as they were seen and experienced. However the format proved to be too complex and lacked showing any real discernable patterns. As mentioned, it might help to redefine the concept of image components. Also on the notation form, the image components were organized into three sequence patterns - feature/activity node, landmark and focal point. Results may be more conclusive if all image components were condensed into one sequential pattern or arranged in some other kind of format.

Overall, the participant's critique of the notation system contained comments such as "having a lot to understand", was "very exacting", and "took awhile to catch on". After completion though there was somewhat of a turnaround, from where they "didn't understand what it was leading up to", to reviews "as one progressed the system made sense, became engrossing and one could see patterns emerge".

The notation format was created as an analytical tool for graphically illustrating visual and non-visual sensory experiences derived from contact with environmental elements and conditions. Though this system is meant to generate criteria for making improvements in urban pedestrian-orientated types of design, this technique could overlap into other areas of landscape design as well. One respondent suggested "this knowledge could be transfered to residential design, especially the aspects relating to sound quality and the use of certain areas for activity nodes".

The graphic quality of the format was described "as communicating the information in a well organized manner" and the symbology was characterized as being "a logical shape to the ideas portrayed". In a way when one views the notation system as a whole, it seemed to symbolize as respondents alluded, "to a language of urban hieroglyphics".

SECTION THREE

CONCLUSIONS FROM THE POSITIVE FACTOR CORRELATIONS

Conclusions drawn from these results show, as to be expected, the visual aspects of an environmental experience are the strongest. The high percentage of sound influences are not surprising, considering its urban

context, but the positive quality of it is. This was caused by several factors: the enhancing effect of water in areas 3, 8 and from the fountain on the other side of the river and the heavy concentration of vegetation, typical in a park-like setting such as this; all of which had the ability to redirect the observer's auditory attention to sounds other than traffic. It may be presumed that sonic quality was also high in area 3 because of its' sonic resonsance characteristic. This would correlate with Southworth (1969) contention that memorable environments contained sounds which communicated something about the spatial structure. The olfactory influence was minimal and improvements should be made because, as one participant's experience illustrated, it has the potential for reflecting the contents of a space and therefore, reinforcing the imagery of the setting. From earlier discussion, the disparity of physical influences seem to be due more to the confusion of terminology than due to actual conditions on the site. Wind was about the only climatic condition having an effect on body sensations, as noted in areas 1,7 and 8. There was one mention of the glaring effects of sun reflections off the river and the awkwardness of movement from continually turning on the path in area 6. Though these effects had a strong influence on the people who noted it, there were no similiar responses from the other observers.

One other factor leading to the positive imagery assessment was examplified by area 3. It was the only area with a grouping of several image components (feature, focal point and activity node) within the actual space. Each image component was represented by an element or elements within the confines of that space, this differs with some other areas which were cited more for components off the site. This denotes the potential for a strong essence or "sense of place" experience, since it was felt and commented on there more than in any of the other control areas.

CONCLUSIONS FROM THE NEGATIVE FACTOR CORRELATIONS

Conclusions from this data show that the strongest judgement about the negative aspects of a setting were (same as the positive aspects) based on the visual setting, but a strong non-visual connection was also apparent. The lackluster quality of area 7 was strongly sensed and seen, meaning that the respondent's negative reactions were caused by a feeling just as tangable and real as the visual experience. So just as the "sense of place" aspect contributed to the positive imagery in area 3, the opposite effect was experienced in area 7. Observers considered it a transition space and it did not contain any strong image components within the space. This

could mean the area lacked identity and character. It gave one the impression of being in limbo. This usually does not promote an assured, secured feeling. People like to be either "here" or "there", not on "the dividing line" as one viewer described it.

SECTION FOUR

RESEARCH IMPLICATIONS

The goal of this study was to: one, define the primary sensory factors used in experiencing the outdoor environment with particular consideration to how they formulate the basic mental imagery of an experience and two, design a format for recording and illustrating the type and quality of sensory contact, which in turn, can be used to make recommendations for improving existing site conditions. The methodology for this research was based on the conceptual ideology that sequential movement, conducted in the pedesrtian mode, is the way to have the closest and most meaningful contact with our environment.

Though not a strong emphasis of the study, this methodological process adds to the body of similiar research conducted by designers Appleyard, Thiel, Lynch, and Halprin who all believed "the experience of the city is basically a moving view, and this is the view we must understand if we wish to reform the look of our cities

(Appleyard 1964 p.63). Experiences joined together by the common thread of movement is an activity coined by Cullen (1961) as "serial vision". It is composed of two elements: the existing view and the emerging view. The juxaposition of these views create a vivid impact upon the sensibilities. This phenomena may or may not have the desired effect.

For example, in area 7, the participants moved from a park-like setting (the existing view) to an urban-like one (the emerging view). The transition, because it was a sharply contrasting one, was strongly felt. One could hypothesize the image quality of that area may not have been judged so severly if the space was assessed using a random viewpoint analysis. It also leads one to wonder if a situation like this would have been apparent at all if each area had been judged as a total, separate entity. One avenue of future research would be to compare results of a sequence notation system with conventional overlay methods to see if the same design strengths and weaknesses are visible.

Several general conclusions pertaining to the attributes and shortcomings of the site design and use of materials have been determined. A description of these conclusions are as follows:

DESIGN STRENGTHS

1. The design layout is sensitive to the surrounding landform. In area 3, existing slopes and constructed berms were used to create and define spaces and direct or enframe views. Also a majority of the areas incorporated fluid transitions between spaces by subtle use of stepping sequences and ramps.
2. Appropriate variety and placement of plant material created novel sonic diversions where needed. The selected species of oak trees and pampas grasses planted near the city-side perimeters of the park served to mask undesirable urban noises and contributed as a nearly year-round, enhancing sonic experience.
3. Water attributes were dynamically emphasized. Water elements such as fountains and waterfalls, compared to reflecting pools, created a positive, naturalistic sonic quality within a typically urban environment.

DESIGN WEAKNESSES

1. The park/city edge treatment is ambigious in area 7 and needs more consideration towards definition and transition possibilities. Also undesirable visual intrusions should be screened or have visual attention redirected.

2. In area 6, the path configuration is awkward and a smoother turning radius should be incorporated.

This research reaffirms previous environmental perception and behavior studies (Rapport 1977, Ittelson 1978, Southworth 1969) noting the overuse of visual stimuli in the urban environment. The study of non-visual stimulus can lead to novel or interesting means for improving, or at least masking non-changeable site conditions. A study of non-visual phenomena under different conditions may also reveal new or multiple use design elements and/or criteria.

For example, auditory data collected from area 3 revealed a sonic duality created by the space's u-shaped, recessed, spatial form. When the waterfalls are running, the sound effects are mulpilied by reverbrations off the surrounding walls. This configuration causes water to be the predominately perceived sound, even though there were other noticable sounds nearby. Likewise, when water isn't running, the space could function as a sonic barrier by muffling sounds from the upper level. This example opens up for speculation another study in what might be the sensory experiences of a site as visited under different temporal conditions such as seasonal or daily changes.

Also it may be concluded that generalizations about urban sensory quality can not be made. It was

illustrated in the results that auditory conditions need not be consistant with the perceived imagery of a space if there are other conditions which influence a positive or at least neutral acceptance of that sound. For example, traffic sounds were considered undesirable in most of the areas. However this was not the case in areas 4, 5 and 7. The source was located some distance away and created the auditory effect of a low, background rumble and was not considered a detracting factor.

In conclusion, any future research promoting urban sensory awareness for the people who enjoy and the people who design those environments will futher the cause in transforming generic, bland spaces into places of multisensory experiences and contrasts. Hopefully this will eventually lead to, as Southworth surmized, "sensory awareness of city residents and the provision of an environment more responsive to human action and purpose" (Southworth 1969, p.70).

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APPENDIX A

DESCRIPTIVE CHECKLIST

DESCRIPTIVE CHECKLIST

Control area

1. CONTEXT OF OBSERVATION
   This dimension defines the information nesessary to sufficiently portray the attributes of space, ie. landforms, landscape features, structures etc.; your orientation and type of movement, and activity attitude.

SPATIAL COMPOSITION - Chose the main objects (natural and/or built) that you feel compose and define the character of this area. For example, these objects may be trees, berms, buildings, outdoor furniture, sculptures, fountains, bridges etc.

_____
_____
_____
_____

VIEWER MOVEMENT - This relates to the physical pattern of your movement. List in the sequence of experience, your progression through this space. Movement activity includes walking, 90 degree turns to right/left, circling turns right/left, up/down stairs, and gradual ascent/descent.

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

ELEMENT PLACEMENT & IMAGE FUNCTION - Do you see or experience any element, on or off-site, that has high visibility, is clearly defined and has the capibility of evoking a strong mental image.

YES_____ NO_____

If so, identify the element and mark which image attribute(s) you percieve it to be.

element	attribute				
	feature	activity	node	focal point	landmark

VIEWER ACTIVITY ATTITUDE - This relates to the extent of your interactions with the landscape as if you were to experience this space on your own and at your pace. For example activity may encompass walking, standing, climbing (on site features), sitting (on grass,benchs,steps etc.) and reposing (on grass). List the activity or activities you would likely do in this space.

_____ _____
_____ _____
_____ _____

11. CONDITION & CHARACTER OF SENSORY MODES

This dimension defines the various ways you make contact with your surroundings. Vision, sound and smells are examined to what you consider important to the experience. The duration of experience and qualitative aspects are also assessed.

VISIBILITY MODEL - This includes the visual aspects and attributes of the control area, ie. the types of views, viewing patterns of major elements, visual focus, and scenic distiction.

Viewshed type: this is considered the amount of area visibile from your viewpoint; this may include the screening effects of vegetation, landforms and objects. Viewshed types are vista, closed vista, panoroma, screened panorama.

Place a checkmark next to the type of viewshed(s) most apparent in this setting. Also mark if the viewshed(s) you select is typical of what you see in front of you, to your right, to your left, or all sides.

viewshed	in front	to the right	to the left	all around
vista				
closed vista				
panorama				
screened panorama				

IMAGE SEQUENCE PATTERN - This relates to the elements you chose in the context of observation dimension section, which were important to the imagery of these surroundings. Do you see any one or more of these elements within your viewing field? YES_____ NO_____

* If so, name the element and checkmark the following conditions as apporpiate. Is the element: nearby 0-100 ft, intermediate distance 100-200 ft, far away 200 ft or more.

* Is the element more or less fully exposed or only partially visible, as seen by glimpses?

* In relationship to you, is the element in front of you, to your right, to your left?

element	distance			viewing exposure		placement	relationship	
	near	intermed.	far	exposed	glimpsed	left	front	right

VISUAL FOCUS - This relates to your depth of attention towards the various landscape elements in this viewshed and determines if attention is more likely to focus on individual elements and details or on overall landscape composition and views. In what manner are you most likely to view this area?

focus on details_____ focus on overall views_____ focus on both_____

SCENIC DISTINCTION - This is a visual quality assessment to determine the degree of articulation and visibility, novelty of content and vividness of imagery. Do you see this area as:

very distinctive_____ somewhat distinctive_____
somewhat ordinary_____ very ordinary_____

AUDITORY FACTORS - This relates to sounds which you percieve in the vicinity and are characteristic of the surroundings.

* List the sounds you hear.

* Are the sound(s) emitted from a source - nearby 0-100 ft., intermediate distance 100-200 ft, far away 200 ft or more.

* What is the intensity of the sound - soft, normal, loud

* Assess the qualily of the sound in how it affects your experience of this area - enhancing, netural, detracting.

sound	distance			intensity			quality		
	near	inter.	far	soft	normal	loud	enhancing	netural	detracting

SONIC RESPONSIVENESS - This relates to the landscape elements and spatial cmpositions in an area that have the potential to intensify sounds - sonic responsive, or have the potential to deaded sound - sonic barriers.

Do you percieve this area to function in either way? YES_____ NO_____

If so, check which one and describe the elements that create this condition.

sonically responsive_____ _____

_____

sonic barrier_____ _____

_____

OLFACTORY FACTORS -

Do you notice any type of smell in particular? YES_____ NO_____

If so, name the source and mark if the smell has an enhancing or detracting effect on your experience.

smell	quality	
	enhancing effect	detracting effect

111. IMAGE AWARENESS & ASSESSMENT

In this dimension, sight, sound, smell and changes in body state are assessed to what degree and to what effect they produce a heightened state of awareness to the surroundings, reinforce the character of the setting and stimulate a vivid image/remembrance of the space and experience.

IMAGE STRUCTURE & STRENGTH - Determine the effect of the following experiential factors according to the extent of their influence as described above, also mark in the influence is a positive or negative one.

factor	extreme influence	strong influence	slight influence	little to no influence	positive	negative
views						
sound						
smell						
physical						

* NOTE - THE SECTION TO BE COMPLETED AT THE END OF THE EXPERIMENT

COMPOSITE IMAGE QUALITY - Evaluate the image character of the site as a whole. Take into consideration the role of sensory modalities, the site's physical appearance, and your personal associations and meaning towards the experience. Determine the area(s) where you have a positive/memorable experience and where you have a negative/inferior unremarkable experience.

control area	highly memorable	most unremarkable

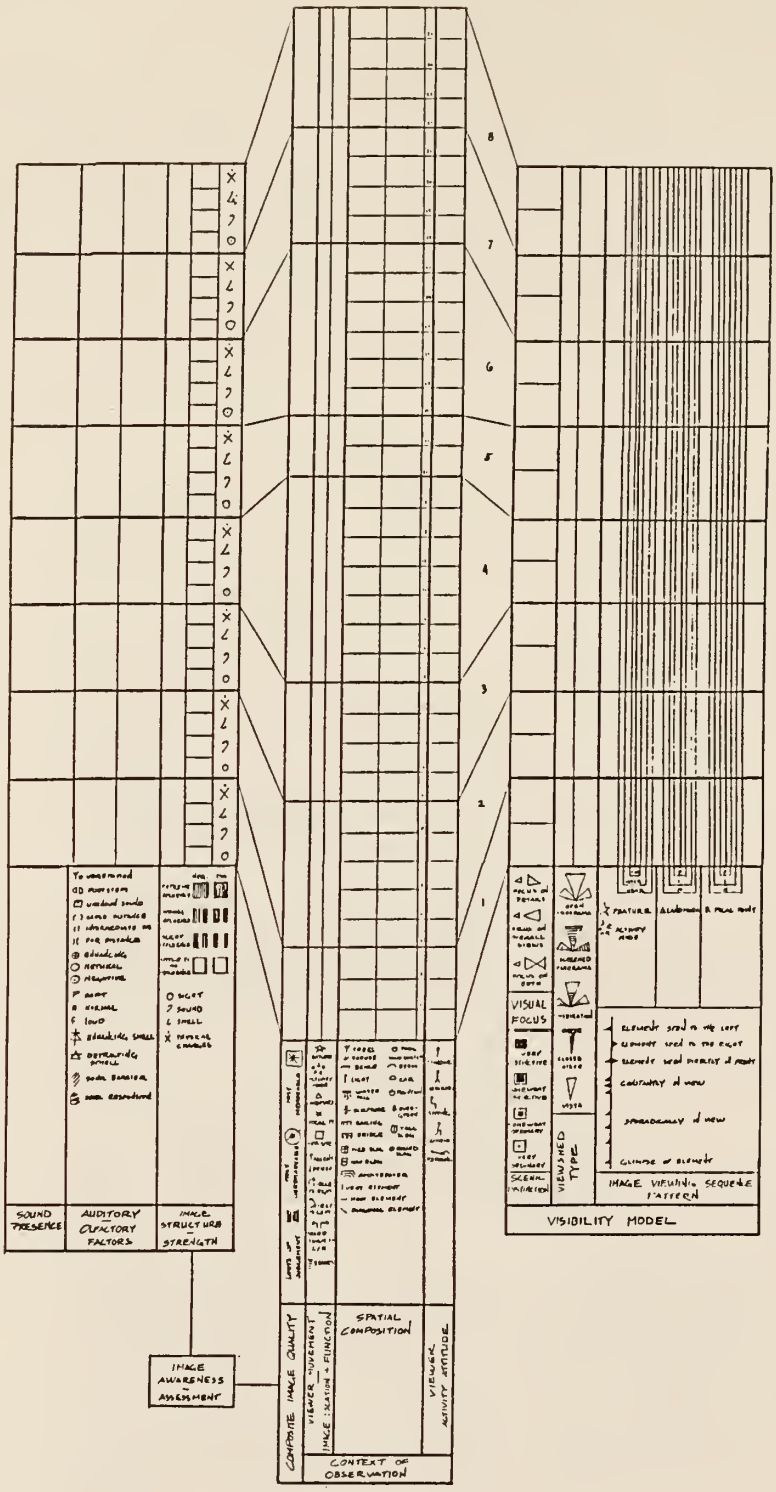
ADDITIONAL QUESTIONS -

* In the area(s) you considered most memorable and having positive imagery, what factor(s) contribute to that choice?

* In the area(s) you considered unremarkable or having negative imagery, what factor(s) contribute to that choice?

APPENDIX B

NOTATION SYSTEM

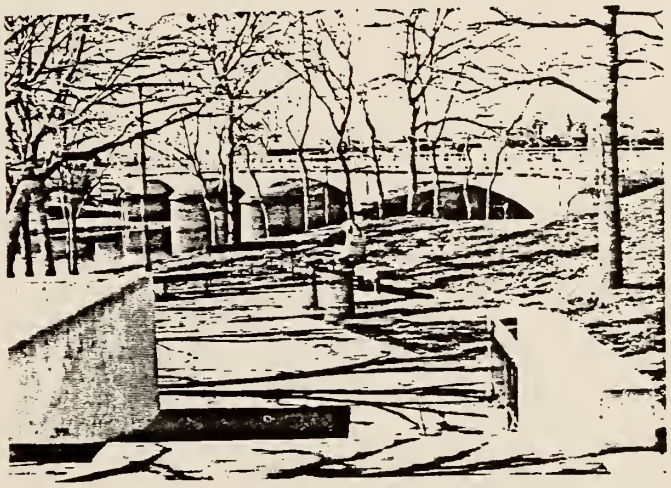

SOUND PRESENCE
AUDITORY OLFACTORY FACTORS
IMAGE STRUCTURE STRENGTH
IMAGE AWARENESS ASSESSMENT
CONTEXT OF OBSERVATION
SPATIAL COMPOSITION
VIEWER ACTIVITY ATTITUDE
VISUAL FOCUS
VIEWSHED TYPE
IMAGE VIEWING SEQUENCE PATTERN
VISIBILITY MODEL

APPENDIX C

PARK PATH SEQUENCE

AREA 1

6



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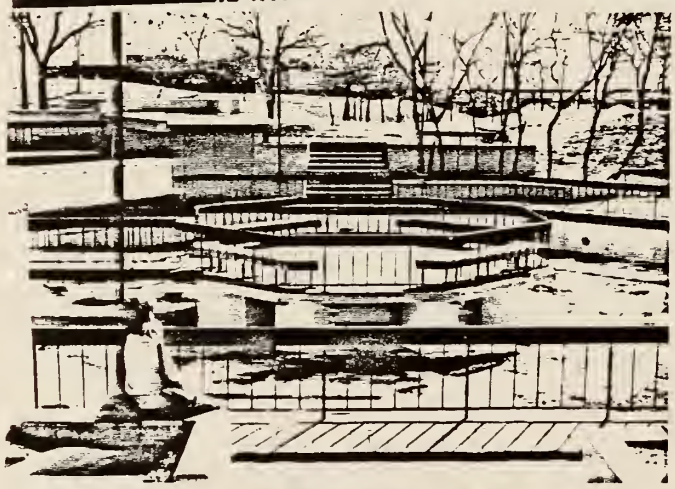
AREA 2

9

AREA 3



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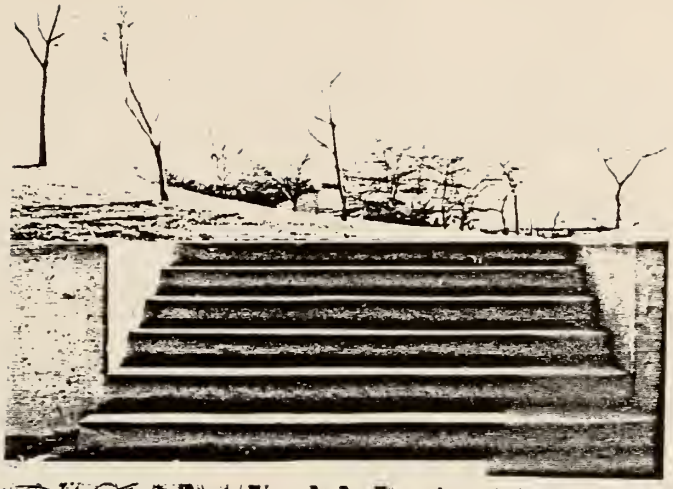

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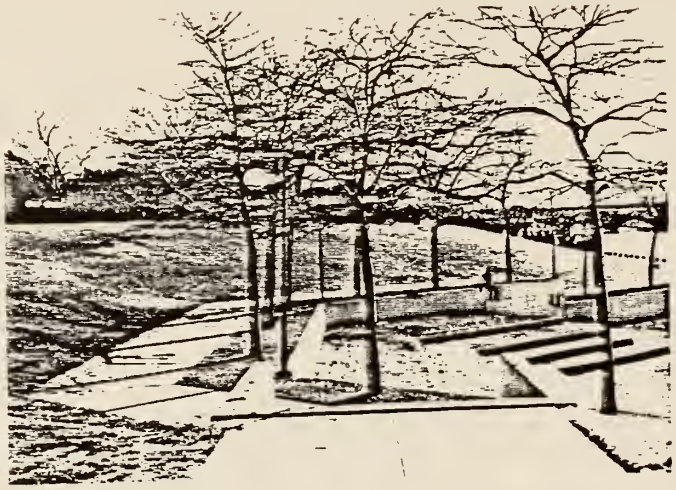

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AREA 4

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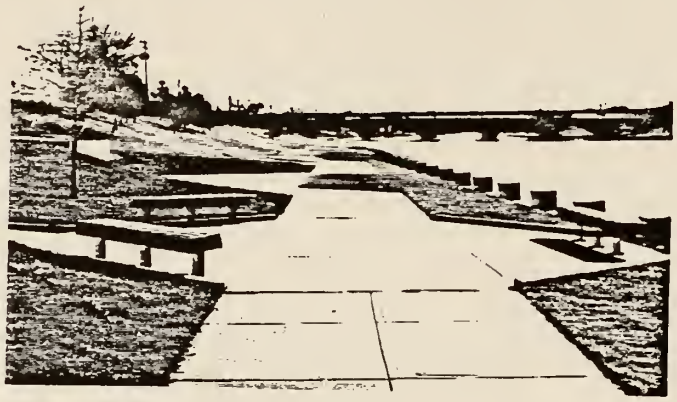

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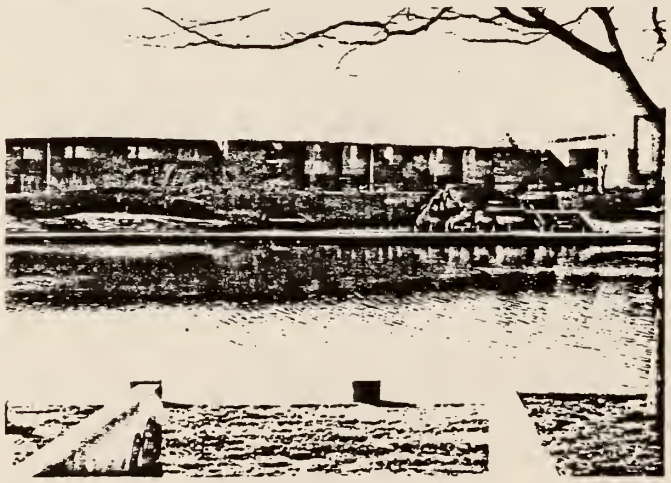

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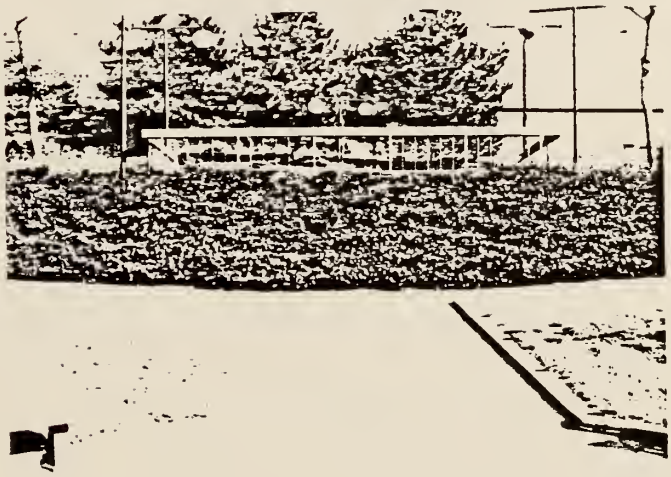

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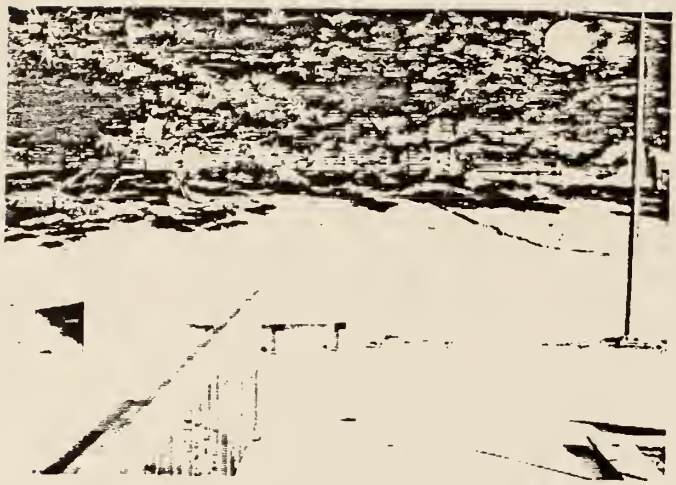
AREA



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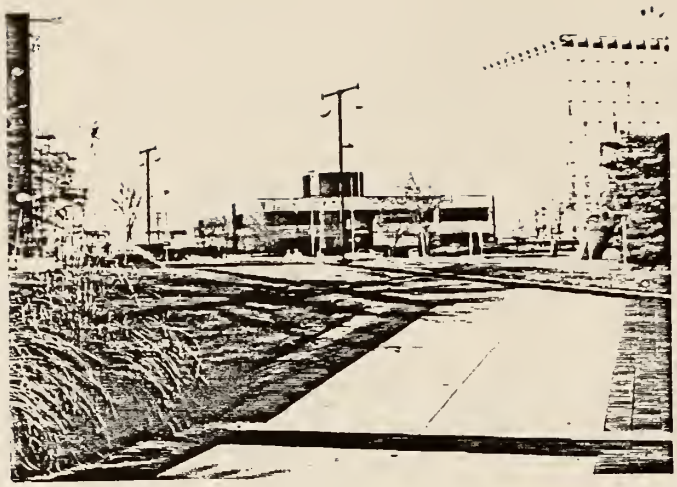
AREA 7



33

32

AREA 3

31

35

34

AN URBAN ENVIRONMENTAL PERCEPTION STUDY: THE NOTATION OF A SENSORY EXPERIENCE

by

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AN ABSTRACT OF A THESIS

Submitted in partial fulfillment of the

requirements for the degree

MASTER OF LANDSCAPE ARCHITECTURE

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Manhattan, Kansas

1988

ABSTRACT

This research study presents data on how the sensory modalities - sight, smell, sound and physical activity - combine to produce the image of an urban experience. The data was collected with a descriptive checklist and transcribed onto a graphic, sequence notation format for evaluation purposes.

Data results revealed that the components of an image are based, from strong to low level of influence, on visual, auditory and olfactory stimuli. Physical activity and responses to environmental conditions had very little to no influence. Similiar groupings of positive or negative responses to environmental content, quality and degree of contact were found to produce either highly memorable (positive) experiences or unremarkable (negative) experiences.

Memorable areas contained multiple image components within the boundries of the area experienced and had a strong relationship between the sensory modes and physical elements of that space. Areas with negative assessments were ambiguous in content and lacked sensory focus.